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ABSTRACT

The premise of this project was to reveal the differences in job-style requirements by using a technique called cognitive-style mapping, the thesis being that each job or occupation requires a person having a particular cognitive style system compatible with the job style or requirements. Cognitive style mapping is a technique used to assess an individual's style for surviving in a given environment--educational, occupational, or social. The project was an extension of the present use of cognitive mapping techniques in a small number of schools on a pilot basis to determine a student's strengths and weaknesses in an effort to plan his survival for the first year of college. Cognitive mapping instruments and techniques developed in previous experimental or pilot modes by the principal investigator were redesigned and tested for discrimination. Employers of persons in the selected occupations were contacted by letter and in person to recruit participation of employees and their supervisors in responding to the survey instruments related to 28 elements of cognitive style. From the cognitive maps of successful or surviving individuals in the 10 surveyed occupations (accounting, credit and finance, secretarial, clinical lab assistant, medical assistant, licensed practical nurse, drafting technology, electronics technology, surface mining operation technology, and welding technology), cognitive occupational maps were derived. A computer program for scoring and producing these and future individual and occupational maps was produced. It is concluded that cognitive mapping should be advanced from a pilot or test structure to operation status and be utilized in the Indiana Vocational Technical College system. The report contains the maps and analytical data for the ten job titles. (JT)

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FINAL REPORT

EXPAND THE USE OF COGNITIVE-STYLE MAPPING AS A COUNSELING TOOL

Ray G. Boyer

Project No. 13-76-C-11

INDIANA VOCATIONAL TECHNICAL COLLEGE

Terre Haute, Indiana

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RAY BOYER
INVESTIGATOR

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II INFORMATION SHEET

A. Kind of Project: (check one)

1 ___	Experimental	4 ___	Demonstration
2 ___	Developmental	5 ___	Evaluative
3 ___	Pilot	6 ✓	Exemplary

B. Population

	TYPE	NUMBERS (affected by project)
A	Disadvantaged	A _____
B	Handicapped	B _____
C	Migrant	C _____
D	Minority	D _____
E	Combination of the above	E _____
F	Other Occupational	F Indeterminate

GROUP

1	Pre-school	1 _____
2	Elementary	2 _____
3	Junior High School	3 _____
4	Middle School	4 _____
5	Senior High School	5 _____
6	Postsecondary	6 _____
7	Adult	7 ✓
8	University	8 _____
9	Employer	9 ✓
10	Employee	10 ✓
11	Citizens	11 _____
12	Parents	12 _____
13	Combination of the above _____	13 ✓

LOCALITY (check the one which encompasses the locality involved)

a	National	a _____
b	State	b _____
c	Region	c ✓
d	District	d _____
e	County	e _____
f	Area	f _____
g	Community	g _____
h	School Corporation (LEA)	h _____

III STATEMENT OF THE OBJECTIVES
and
IV STATEMENT OF THE PROBLEM

Only about a third of the nation's students really master the skills and concepts presented to them in school, but ninety-five per cent are capable of doing so. This is a shameful situation which demands the end of using individual differences as a means of determining who does well or who fails in group competition, and instead, adapt to these differences in Cognitive Styles as a means of varying teaching or instruction techniques to insure the individual's success in his educational career.(1)

"It is quite obvious that traditional theories which place the high school graduate at a certain fixed level of achievement, skill, and content knowledge, are not acceptable; and the effort to make such rigid theories acceptable, both in high school and in college, has resulted in the loss, or at least the frustration, of vast numbers of young people." "We should base our policy on the most generous and promising assumptions about human nature (potential) rather than the most niggardly and pessimistic. Men will do their best only when they assume they are capable."(2)

All men are alike though infinitly various---William Blake

Why does one person perform and succeed at a job; whereas another person would consider that job uninteresting, unchallenging, etc. Why does one worker think nothing of climbing catwalks or ladders and performing job tasks while another person would say, "Not for me," I'd rather sit at a desk and work with words or figures."

The premise of this project is to reveal the differences in job-style requirements by using a technique called Cognitive-Style Mapping.

The thesis being that each job or occupation requires a person having a particular cognitive style-system compatible with the job style or requirements.

In one segement of the study, three different job-titles from the same occupational field, Health Occupation, were reviewed: Licensed Practical Nurse, Clinical Lab Assistant, and Medical Assistant; yet, it was revealed that each was peculiar in style.

Presently, Cognitive Mapping Techniques are being used in a very small number of schools and colleges in Michigan, Florida, Texas, New York, and Virginia in an experimental or pilot basis to determine a student's strengths and weaknesses in an effort to plan his survival for the first year of college. The impetus of the effort is not to shield the student from incompatible style differences but to strengthen the student's style-deficiencies so as to enable him to succeed in a chosen academic endeavor. With this effort, education becomes more personalized by offering a variety of alternatives to the traditional class-teacher approach.

Indiana SBVTE Project 13-76-C-11, Applying Concepts and Techniques of Cognitive Style Mapping at IVTC-Terre Haute, is a step further in personalizing learning by determining the specific style requirements of particular occupations in contrast to the broad general requirements of the Academia.

Cognitive Style Mapping is a technique used to assess an individuals style for surviving in a given environment--educational, occupational, or social. Each person has his own particular style for perceiving meaning, operating, or making decisions.

A student's cognitive style is determined by the way he takes notice of his total environment. Cognitive Mapping displays his style for seeking meaning, for becoming informed, it reveals whether his style is to learn by listening, or reading, feeling, hearing, seeing, comparison, relating, working alone, or in groups, sensing, etc.

Socially or operationally, a person's map reveals whether he is an individual, concerned only with his points of view, or does he seek the advice or assistance of friends or associates, or is his style to seek a place in the family or, "extended family"---a group or organization.

How does he reason or make decisions. Is he a similic or metaphoric thinker--in other words, does he compare and contrast: Or, does he reason categorically. Does he see the part in relation to the whole and the whole in relation to the part ---holistic reasoner.

Classroom teachers are aware that each student comes to know what he knows in his own unique way. Until recently, however, there was no established framework for teachers to analyze the learning habit of their students and match them with the best method of instruction. Dr. Joseph Hill, President of Oakland Community College, changed this by developing the educational science of Cognitive Mapping.

In a similar manner, a given occupation has certain style requirements. Succintly, accountants are not electricians because "It's not their style." The nucleus and common denominator of Cognitive Mapping is the vocabulary developed by Dr. Hill and associates. Dr. Hill and his associates decided that education, as an applied science, would never appear nor function as a system unless it were brought within a logical conceptual framework and given a common language.

V PRIORITY AREA

At the present time, the learning resources center at IVTC-Terre Haute is using a valid testing program to predict traditional academic success. Equally important, but currently undeveloped, is a tool to predict occupational success, or success on the job. A teacher's perception of a "good" student in the classroom does not always predict occupational or life success.

Each student learns or perceives meaning in a way which is unique to him/herself. Each teacher teaches in a way unique to him/herself. Teaching styles sometimes conflict with learning styles, increasing the chance for student failure. In addition, without a valid tool to assess a student's learning style, it is difficult for a teacher to become aware of that student's learning style differences, and to then take action to cope with them.

Employers have difficulty giving meaningful feedback to educational training institutions relating to program content/delivery methods. They can identify "good" or "successful" employees, but have a problem relating certain characteristics of those employees to an instructional program. For example, in a group of 15 technically competent employees, an employer might single out five that are his "best." The employer may have difficulty in communicating how the employees differ; the employer just knows they are different.

Cognitive Style Mapping is a concept which has application to each of these problems. It is a procedure which assesses a person's attitude towards himself, toward others, and towards his environment. Each individual has his own cognitive style (the way in which he perceives meaning), and each occupation requires a definite cognitve style. By identifying a student's cognitive style and by knowing the cognitive style for specific occupations, IVTC-Terre Haute will be able to: (1) improve counseling techniques by enabling an assessment of the style and potential of prospective students for a given program;

(2) increase educator awareness of student learning style and potential; and

3) improve employers' ability to articulate what constitutes a "good" employee and provide meaningful feedback to the instructional programs.

VI STRATEGIES

GENERAL STATEMENT:

Mr. Ray Boyer of Indiana Vocational Technical College-Terre Haute the principal investigator for the Cognitive Mapping Project had been developing Cognitive Mapping instruments and techniques for three years in experimental or pilot modes. However, the instrument was re-designed and tested for discrimination

Future projects may wish to inject a control factor with a high degree of variance, but for this project it was decided to use positive discrimination.

The investigator followed the Time and Sequence Budget as represented by the delineation and flow-chart on page 63 .

SPECIFIC STATEMENT:

Employers of persons in the selected occupations were contacted by letter with an accompanying response card to determine those companies or employers who wished to participate in the project. (see page 80)

Upon receipt of the response-cards, the investigator made an appointed visit to the "contact-person" to explain Cognitive-Occupational Mapping and to gain final approval for employer participation.

After final approval, a specially prepared survey-instrument package was presented to each employee in the surveyed occupation. The package was a pre-printed 10" by 13" envelope containing: 1. The Questionnaire Booklet, 2. A Response Sheet, 3. A Tally Sheet.

No directions were given to employee participants other than "Read and follow the directions on the envelope and the questionnaire booklet."

Another instrument, a Supervisor's Empirical Scan, was left to be

completed by immediate supervisors of the job or occupation being surveyed.

The supervisor answered questions directly related to the twenty-eight (28) elements of Cognitive Style but to be answered in direct relation to the job or occupation he supervised.

After the testing period, all "packages" were collected and assembled categorically according to Indiana Vocational Technical College program code titles and numbers:

01 Accounting
06 Credit and Finance
12 Secretarial
28 Clinical Lab Assistant
37 Medical Assistant
44 Licensed Practical Nurse
54 Drafting Technology
64 Electronics Technology
(76 Surface Mining Operation Technology)
(80 Welding Technology)

SCORE AND TALLEY:

The transferring of number-weight responses to a tally-sheet was time-consuming, tedious, and laborious. There were 140 questions on the questionnaire containing five responses for each of the twenty-eight (28) elements measured. The tallyer's job was to pick the response for each element. Example: TAL (Theoretical Auditory Linquistic) was measured by responses to items 7, 29, 43, 46, 50. Each response was weighted on a scale of 1 to 5, 1 - Almost Never, 2 - Seldom, 3 - Sometimes, 4 - Often, 5 - Almost Always.

This time comsuming segment of the process has since been diminished through a computor-assisted-talley program (punch-card) designed by the computor program department of Indiana Vocational Technical College (Mallory), Indianapolis, Indiana. The time to tally a response sheet has been diminished from 40-45 minutes to approximately two and one-half minutes. The hand-score method took approximately 40 to 45 minutes. Data from the talley sheets was then transferred to a matrix for each Indiana Vocational Technical College related occupation.

From the matricies certain visual empircisms could be fostered as to tendancies of the surveyed group to "cluster" in particular elements, e.g., accountants tend to cluster between 18 and 21 for the "R" Modality of Inference. Also, percentages of the total number of the sample which showed a "Major" could be determined, e.g., 86 per cent of the accountants display Major "M" and "R", 75 per cent are Major "D". and 35 per cent are Major "K" in Modality of Inference.

The other statistical statements such as mean and standard deviation were determined by using the data from the matrix, e.g., accountants produced a mean of 19.4 with a standard deviation of 2.4 for the "R" Modality of Inference.

From the analysis of matrix-data Occupational Maps were derived.

Investigators Note: A total computer program, scoring and map statistics, has been designed whereby individual maps can be produced in minutes and an Occupational Map can also be produced in a matter of minutes from the time of the data introduction to the computer.

Matrices, Maps, Map-statements, and conclusions for each of the occupations surveyed may be found in part VIII, Findings.

Investigators Note: The only data-base, norm or statistical reference in Cognitive Mapping is the INDIVIDUAL himself and the description he produces of himself. Each Map is unique and separate. However, in Occupational Mapping, a description of style-similar persons who are "successful", survival within a given occupation dictates the numerical or statistical requirements. *If 78 per cent of those surviving in the occupation display a dominance or Major in a given Cognitive Mapping Element, then observers should conclude that that is a style Element of that particular occupation. An Occupational Map, like the Cognitive Map, is an arrangement of those style elements (Majors and minors) necessary for survival or success.

In the following pages are descriptions of Occupational Styles derived from tabulations of produced means, standard deviations, and per cent of Majors used to derive a description of the apparent Cognitive Style of a given Occupation.

The reader should look at the mean in relation to the standard deviation in relation to the per cent of Majors. All three must be viewed as a composite descriptive statement and not individually.

* This is an arbitrary figure to represent a Major.

VII ANALYSIS

Cognitive Style Mapping is a technique of describing each individual's style of surviving in a selected or given environment. In any assessment or description of human behavior nothing can be considered definite or absolute. Therefore, we are forced to use terms as "tends to," "appears to," "tendencies," etc.

No one is dominated entirely by one element of Cognitive Style. Instead, each of us is a complex combination of the 28 or more elements of Cognitive Style. The occupations or environments that we choose and thrive in require those combinations of Majors and minors that are compatible with our style.

> A Major in any element means that in a scenario situation a person would perform, or tend, to at least 70 per cent. A minor would indicate a performance or tendency of between 40 and 69 per cent. Less than 40 per cent indicates a negligible or non-style.

Success in an educational environment depends on the compatibility of the learner's style with that of the educational system. It is hoped that the results of this initial Cognitive Mapping Project will provide a starting place for:

1. The future counseling of students toward occupations which are compatible with their cognitive style.
2. The future counseling of students towards training needs based on comparing a students style with a chosen occupation. Thereby changing a student's style so as to be more compatible with the chosen occupation.
3. The designing of learning systems to be more compatible with occupational styles and learner styles.
4. Increasing a students knowledge of himself (QCS-Qualitative Code Synnoetics) by making the student aware of the strengths of his style.

VALIDATION:

In more than 300 interviews with Mapped persons, not one denied, refuted, or repudiated the interviewer's style-assessment of the Mapped person.

The question-eternal of all statisticians and researchers is, "Is it valid." First of all, Cognitive Mapping is not a test of intelligence or aptitude it is a form of directive-interview technique designed to describe tendencies of an individual or a group. The directive interview is a time honored method used by many personnel interviewers.

Personnel Departments receive specifications for a particular kind of person to fill a particular kind of job. It is then the interviewer's task to design the interview questions to elicit the person he is looking for.

Cognitive-Occupational Mapping shortens this process from days to minutes and provides a language to identify twenty-eight (28) elements of Cognitive Style. The interview may contain from 155 to 240 questions. Each element is assesed by five to eight senario situations to which the interviewed person responds numerically:

1. Never
2. Seldom
3. Sometimes
4. Often
5. Almost Always

The interviewed person will then produce a score on a scale of 5 to 25 for each Element.

PREDICTION:

Is Cognitive-Occupational Mapping a predictor? ---Only in the extent of a percentage scale. For example: if a person produces a score of nineteen on a scale of 5 to 25 in any given Cognitive element, we can then say that 76 per cent of the time he will tend to, prefer to, or perform in

a Major mode in the element assessed. Educationally, if a potential student produces a low score in an element that has been deemed necessary for academic survival, then counselors can design his educational track to strenghen his style in that particular element. At the same time, the counselor can schedule or design the student's track so as to avoid the student's confrontation with subjects or classes that require strength in the given element until the student alleviates or eliminates his style deficiency.

Occupationally, if more than 70 per cent of the successful workers in a given occupation produce an element-Major (a score of 18, 72 per cent, or more), we can assume that that element is an element of the style of that occupation. Majors of the 28 elements displayed by those workers then produce a Cognitive-Occupational Map. Then, if applicants for the occupation are matched with the derived map, we can assume a greater than 50 per cent chance of worker success—90 per cent.

Is it valid? Yes to this extent. One of the ways validity is checked is to compare a "satisfied and successful" individual (as in this case an employee) with the scores on his own group-scale. If more than 70 per cent of those surveyed indicate an element-Major with a relatively narrow standard deviation, we can assume that this is a valid measure of the group in question. Because we are dealing with empirical descriptions in Cognitive Mapping, criteria must be considered parametric and not absolute. Scores should be used as indicators, rather than decision makers.

SIGNIFICANCE:

Is Cognitive-Mapping better than a coin-toss? The present acceptable method of interviewing is not, because most educational,business, and industrial institutions are living with the accepted 50 per cent attrition rate.

The thesis behind Cognitive Mapping is, "Ninety per cent can learn ninety per cent of the material ninety per cent of the time if the individual's Cognitive Style is known.

In a pilot-project, General Motors used the Cognitive-Mapping technique to select, design training, and train 30 first-line supervisors. Twenty-seven were graduated from a community college, which had designed their training based on their Occupational Map, with grades of B-plus or better in a two-year Associate Degree Program in Management (27 of 30 is 90 per cent).

> One of the participants became pregnant and had to drop out, One claimed that the training was disruptive to her family life, and one said he just did not want to be a supervisor. These are variables difficult to control in a Cognitive Map.

At the last report GM was integrating these trained supervisors into supervisory positions created by vacations, sickness, or part-time situations and expressed delight with the results.(3)

CONCLUSION:

Cognitive-Occupational Mapping simply states that, if 70 per cent or more of the survivors of the 50 per cent attrition process express a Major in a relevant Cognitive Element, it would be wise to make sure that all those entering that occupation possess the same Major.

VIII FINDINGS

ACCOUNTING

THEORETOCAL:

The theoritical elements reveal a person's tendencies for surviving in an academic situation, i.e. the learning of theory and concepts.

Entering accounting students should reveal at least a minor TAL-TVL (refer to page) for explainations of Cognitive symbols) with a slight tendancy toward TVL. Accountants are defintely not TAQ's but show a decided Major TVQ.

In summary, the only needed theoretical Major appears to be a Major TVQ. They should show relatively strong minors in TVL and TAL in that order. TAQ is not their style. Agreed, that they should be Major TVQ but supervisors also empiricized that they should be Major TAL's. This could possibly indicate that these students should receive TAL training. (See suggestions on page 76)

SENSORY:

Accountants produced Majors in all five elements. However, QO and QS are empirically not relevant to this occupation. Of the three, QA, QT, and QS; QT received the most emphasis (21.3 mean, 95% Majors) followed by QV (18.6 mean, 80% Majors).

The accountant survey-data and consequent Map was derived from those successful persons or employees in positions that could be filled by a person graduating from Ivy Tech with a two-year Associate Degree in Accounting or Credit Finance. Both training titles are combined here because employers tended to see them as interchangable at the entry level. Thus, the single title, accountants or accounting student shall be used in this report.

Four organizations participated in this survey: Terre Haute First National Bank, Pfizer Company, Terre Haute, Indiana University, Bloomington and Resthaven of Linton.

In reference to the visual map, page 24, and the statistical data, page 23, briefly, accounting students appear to be "see-do" Relational types who have a slight "I" operational style which should become more prominent if or as they become "accountants."

The sensory elements measure a person's sensory style, the five basic styles in the auditory, olfactory, savory, tactial, and visual. Recent research has revealed that our entire learning system originates at a very early age and stems mainly from the stimulation of these five basic sensory elements. At a recent symposium in Boston, Massachusetts, Dennis Woods stated, as a result of his studies of children in relation to the elements, mud, water, fire, and air (playing with mud), that our entire cognitive and operational system orginates and evolves from this very early period of play.(4)

SOCIAL CULTURAL:

The Social Cultural Elements measure a person's self concept and style of interplay with other persons.

The Accounting group produces a Major of 18.8 with 60 per cent Majors in the Code Empathic Element. Although this is a Major, it is not a high or strong major. In the Qualitive Code Transactional. their talking style or oral-interplay style, they did not produce a Major. They showed a minor score of 15.8 with only 25 per cent Major Transactional.

Basically, this group is not a role-playing or acting-type group. They show a minor of 15.1 as a mean in the Code Histrionics with only 45 per cent

showing Majors in this area. Although this score or mean is a minor score, it is relatively high in considering a vast or total population.(5) 70 per cent of this group produced Majors in the area of Code Kinesics or the ability to read the unspoken body-languages. The mean score was 19.5.

The Supervisors Emperical Scan revealed that supervisors do not consider any of these social-cultural elements as necessary parts in the make-up of this particular job title or occupation. (see note on SES on page 65)

SELF-CULTURAL:

In the area of the Self-Cultural, elements that measure a person's concept of himself, this group produced a very strong Major of 90 per cent with a mean of 22.6 in the area of Code Esthetics, in other words, appreciaters of beauty or the beauty of a job well done.

They are very high in Code Ethics or committment to personal or group values or the drive to complete a task. They have 100 per cent Majors in this area with a 22.6 mean.

In the area of Code Kinesthetics or in the style of the total or whole body performance in a controlled or regulated situation the total group produced a mean score of 15.4 with only 40 per cent showing Majors. They produced a score of 19.4 in the area of Synnoetics or self knowledge of their strengths and weaknesses and the ability to perform within these strengths and weaknesses. 65 per cent showed Majors in this area of Code Synnoetics.

CULTURAL-OPERATIONAL:

In the area of Cultrual-Operational this group is definitely "I" or individuals perfering to make decisions and operate on their own. The

mean score was 18.8. However, only 55 per cent chowed Majors in this area. The second preference would be in the Familial or group (extended-family) element. 60 per cent showed Majors with a mean of 17.8. In the Associative area 55 per cent produced a mean score of 16.1.

In general, we can say that this group is a very flexible group which can operate either in Associative situations or Familial situations or groups, but they have a preference for Individuality.

MODALITIES OF INFERENCE:

Accountants revealed that they are basically "L" types, analytical, troubleshooting, problem-solving types, with a slight preference toward the "M" or catatorical element. The mean score in the "M" element was 20 and 86 per cent showed a preference as Majors. 86 per cent also showed a preference for the "R" element, with a mean score of 19.4. 75 per cent showed a Major preference in the "D" or Differential element with a score of 19.2. As you will notice, there isn't a large variation between the three but a slight preference toward "M." Here are some anotated quotes from an interview with an accountant (Cost Analyst). The quotes are noted as to their Inferential Modality:

R(M) "Direct materials are things that are required to build a motor such as aluminum, copper, and steel."

D "Comparing July 1973 prices to what we are now paying, the cost of aluminum has increased about 40 per cent."

D "The amount of copper wire shown in the photograph below was worth $544 in 1973, now we pay approximately $800 for the same amount."

R "So much of the increase can be passed on in the price of our motors. We've got to remain competitive."

D "A bundle of shaft-steel 3 years ago could be purchased for around $768. Now the same bundle costs $1187."

R(L) "The obvious question is what can be one to control them? We must control internal scrap and rework, constartly look for alternate products as possible substitutes for existing materials."

R "These materials costs are just a small portion of total cost. There is the cost of compensation, supplies, services, utilities and many others."

As these persons progress toward the title "Accountant", the "R" begins to become dominant with the "M" and the "D" becoming less dominant but remaining Majors.

Thus basically, in their Modality of Inference we can classify this group as MR, secondary "D" Majors, with minor "k"-deductive.

It is interesting to note that the Supervisors Emperical Scan revealed that supervisors considered only the deductive as a necessary Major, but the occupation itself produced a minor "k" deductive with a mean score of 16.2 and only 35 per cent showing Majors.

GENERAL STATEMENT OF STYLE:

Basically speaking, this group would be classified as Qualitative Proprioceptive Fine as opposed to Gross. In-other-words they have control of and know where their hands are in space. In contrast they produced negligible in the Proprioceptive Gross area which measures tendencies to control the total body in space. They produced a Major in the Code Temporal, operating within time constraints; so, they are a time-conscious group. Basically, they could be classified as qualitative data precise with attention to details. They are not necessarily a hard driving group, a charismatic power-type group. Their Supervisory Style rests right in the middle with a score of 35, a score close to 29 would indicate a

Participative group and close to 39 would indicate an Authoritarian group, this group could be classified as "Splitters" or role-players when it comes to Supervisory Style. On page 22 is a delineation of Majors or Cognitive Map in two classifications, primary and secondary, for this group.

ACCOUNTANT DELINEATION OF MAJORS AND MINORS: Majors-In Caps
minors-lower case

PRIMARY	SECONDARY
TVQ - (tal, tvl, taq)	
QA, QT, QV	
(qpg) QPF	
QCTM	
QCES, QCET	QCEM, QCK
(qckh) QCS	
I	af
MRD - L (k)	

SUPERVISORS EMPERICAL SCAN

TAL, TVQ

QCES, QCET

QCS, QCTM

I

K

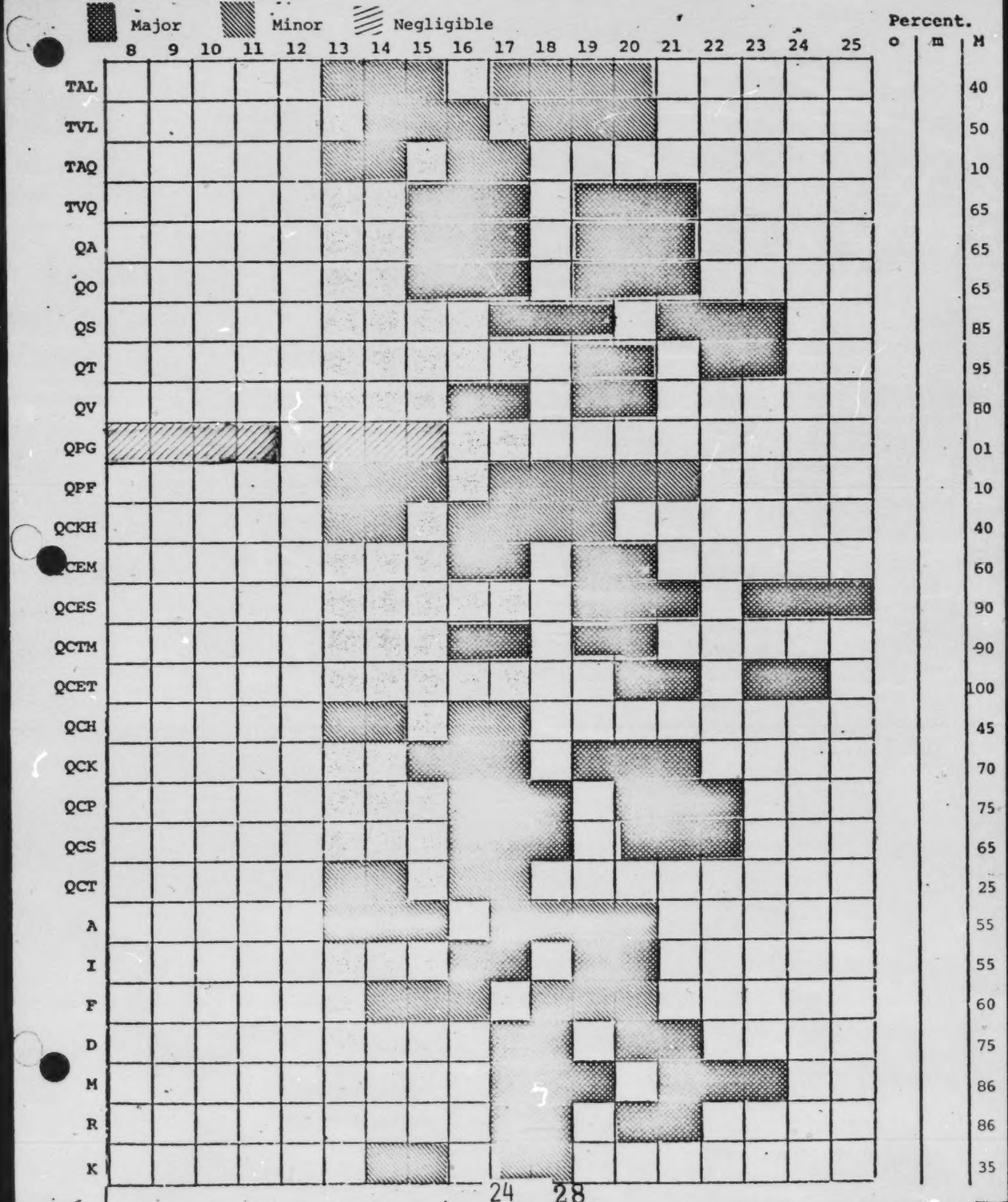
COGNITIVE-OCCUPATIONAL MAP: Statistics Occupation;Aocounting/Credit Finance

SUPR.	EMP.	NEGLIGIBLE	MINOR	MAJOR	ST. D.	% MAJORS	OCC MAJ
M	TAL		16.8		3.9	40	
	TVL		17.0		3.3	50	(X)
	TAQ		15.4		2.1	10	
M	TVQ			18.4	2.9	65	X
	QA			18.4	3.0	65	X
	QO			18.4	2.6	65	
	QS			20.1	3.1	85	
	QT			21.3	2.2	95	X
	QV			18.6	1.7	80	X
	QPG	12.7			3.3	01	
	QPF		16.7		4.5	10	
	QCKH		15.4		3.7	40	
	QCEM			18.8	1.9	60	
M	QCES			22.6	2.6	90	X
M	QCTM			18.5	2.4	90	X
M	QCET			22.6	1.8	100	X
	QCH		15.1		2.1	45	
	QCK			18.9	2.9	70	X
	QCP			19.5	3.0	75	X
M	QCS			19.4	2.8	65	X
	QCT		15.8		1.8	25	
	A		16.1		3.5	55	(X)
M	I			18.8	2.4	55	(X)
	F		17.8		2.8	60	X
	D			19.2	2.3	75	X
	M			20.0	2.8	86	X
	R			19.4	2.4	86	X
M	K		16.2		2.0	35	

SBVTE

Date 13-76-C-11 Organization IVTC-07 Occupation Accounting/Credit Finance

S.S._____ QDP_____ QDG_____ P_____ I/C_____ ASSOC. 1.___ 2.___ 3.___



VIII FINDINGS

SECRETARIAL - ADMINISTRATIVE-EXECUTIVE

One would think that just because secretaries and accountants work in the same general area they would be similar and exchangeable in their jobs or duties. But, this assumption would be far from the truth. A secretary is a secretary, is a secretary and an accountant is an accountant, is an accountant.

A general comparison shows that secretaries are Major TVL's; accountants are not. Secretaries are minor QA; accountants are Majors.

> If a decision were made to "pipe" low-key music into an office through a central address system, it would not bother or hinder the operation of the secretaries - minor Auditory, but it would be wise to eliminate the music from the area housing the accounting department. The secretaries with their special auditory-cue system would hear the music but would block it out along with other extraneous sounds. The accountants on the other hand would listen to the music.

Secretaries are more QT and QPF than accountants. Secretaries as accountants might not have enough to do with their hands to assure job-happiness. Secretaries are more time-conscious (QCTM) than accountants. Accountants look upon role-playing (QCH) as a minor part of their occupational existance; secretaries, on the other hand, see it as a Major style.

Accountants are definitely "I" Individual operators or decision makers; whereas secretaries are "F" Familial prefering to work or function in group or extended-family situations.

> In training, the accountant would be more adaptable to an individualized, self-paced, programmatic, system of learning, whereas the secretary would prefer the traditional class-room approach.

In their respective Modalities of Inference, they are similar, --Major "M", sub-dominant "R" - "D" and minor "k". With the accountant, however, the

"R" Modality has a slight edge, and as the accounting-clerk approaches title of accountant, the "R" definitely becomes dominant. (This is an empiricism made through discussions and interviews with accountants and accounting clerks). (see page 19)

SECRETARIAL DELINEATION OF MAJORS AND MINORS: Majors-In Caps
minors-lower case

PRIMARY	SECONDARY
TVL, TVQ	tal, taq
(qa) QT, QV	
QCES, QCET	QCEM
QCS, QCTM, QDP, QPF	QCH, QCK, QCP
F	a, i
M--RD--k	

SUPERVISOR'S EMPIRICISM

TVQ, TAL, TAQ	(TVL--negligible)
QCES, QCET, QCTM, QDP	QCP, QCS
I	
MK	

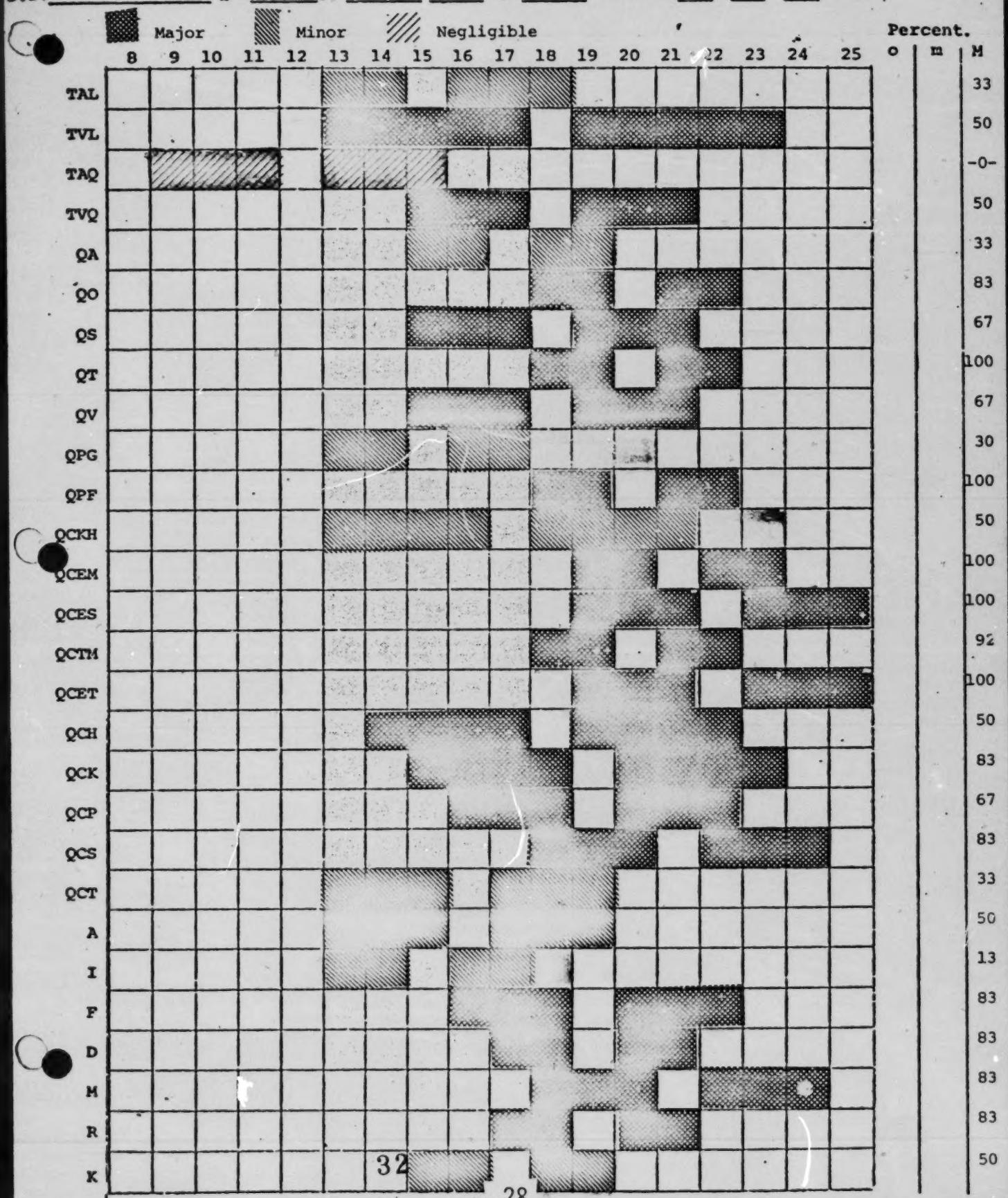
COGNITIVE-OCCUPATIONAL MAP: Statistics Occupation; Secretarial

SUPR.	EMP.	NEGLIGIBLE	MINOR	MAJOR	ST. D.	% MAJORS	OCC MAJ
M	TAL		15.6		2.5	33	
	TVL			18.5	5.5	50	(X)
	TAQ	12.6			3.0	-0-	
M	TVQ			18.5	2.5	50	(X)
	QA		17.0		2.4	33	
	QO			20.3	2.1	83	
	QS			18.0	3.3	67	
	QT			20.8	1.8	100	X
	QV			18.5	2.7	67	X
	QPG		15.3		5.0	30	
	QPF			20.1	1.7	100	X
	QCKH		17.1		6.4	50	
	QCEM			21.1	1.9	100	X
M	QCES			22.3	3.0	100	X
M	QCTM			20.8	2.1	92	X
M	QCET			22.0	2.6	100	X
	QCH			18.1	3.8	50	
	QCK			19.5	4.1	83	X
M	QCP			19.3	2.8	67	X
M	QCS			21.1	2.9	83	X
	QCT		16.5		2.5	33	
	A		16.5		3.4	50	(X)
M	I		15.8		2.7	13	
	F			19.6	2.9	83	X
	D			19.0	2.2	83	X
M	M			21.1	3.2	83	X
	R			19.1	1.6	83	X
	K		17.8		2.4	50	

SBVTI

Date 13-76-C-11 Organization IVTC-07 Occupation Secretarial(Adm/Legal)

S.S._____ QDP_____ QDG_____ P_____ I/C_____ ASSOC. 1.___ 2.___ 3.___



Percent.

o	m	M
		33
		50
		-0-
		50
		33
		83
		67
		100
		67
		30
		100
		50
		100
		100
		92
		100
		50
		83
		67
		83
		33
		50
		13
		83
		83
		83
		83
		50

VIII FINDINGS

HEALTH OCCUPATIONS - CLINICAL LAB ASSISTANTS

Oddly enough, CLA's of the Health Occupation field are not people-oriented--they are "thing"-oriented. They do not perceive the speciman or slide in front of them as being associated with a human body; it is merely a thing to which they "do things."

Looking at their Cognitive Maps, we can say, generally, they are not academic or student-types either. They revealed minors in all Theoretical elements and almost a negligible in the TAQ.

Their Sensory elements show them as "see-do" learners with a strong Familial (F) determinate of operation. In other words they prefer a classroom where the parent-figure (instructor) "shows and tells and they see and do."

The Olfactory and Savory elements (QO, QS) appear to be irrelevant to the occupation, but they show strong Auditory, Tactile, and Visual (QA, QT, QV) discriminations---75 to 88 per cent scored high means.

Only 50 per cent produced Majors in QCEM (Empathetic), but the mean score, 16.8, was a minor.

They show strong commitment to goals, codes, and ideals--(QCET-Ethics) 88 per cent Majors, and a mean score of 20.8. They display a healthy concern for task completion and precision and detail in their work.

They are not physical types. Only 38 per cent revealed Major QCKH-Kinesthetics, and the mean for the group was a minor---15.6. In keeping with a low physical mode, they scored low in the QPG - Total-body-control. They had a mean score of 15.4. It would be well for counselors to keep this low Physical element in mind as an interview point with a physical type applying for training as a CLA. High scores in QCKH and QPG and possibly

QCH would indicate a person whose style was possibly not that of the CLA whose domain is non-physical.

CLA's are low-key role-players (QCH) with only 13 per cent showing Majors; however, supervisors see this as a Major need of the occupation. They are high Kinesics, readers of body language, but the supervisors don't see this as necessary.

In keeping with their low people-orientation, and high Familial mode, they are highly Proxemic, a code of social placement. 88 per cent were Majors.

In their Cultural or Operational determinate, they are definitely (F), Familial with minor (a) and (i) in that order---very low "i."

As mentioned earlier they are "see-do" types. This analysis is further strengthened by their Major Modality of Inference: (D) Comparing and Contrasting is their style with 88 per cent showing a Major, a mean of 20.4, followed by (M) which showed 50 per cent Majors and a mean score of 18.6. They are minor (R) and (K) although Supervisors see the need for stronger (R) and (K).

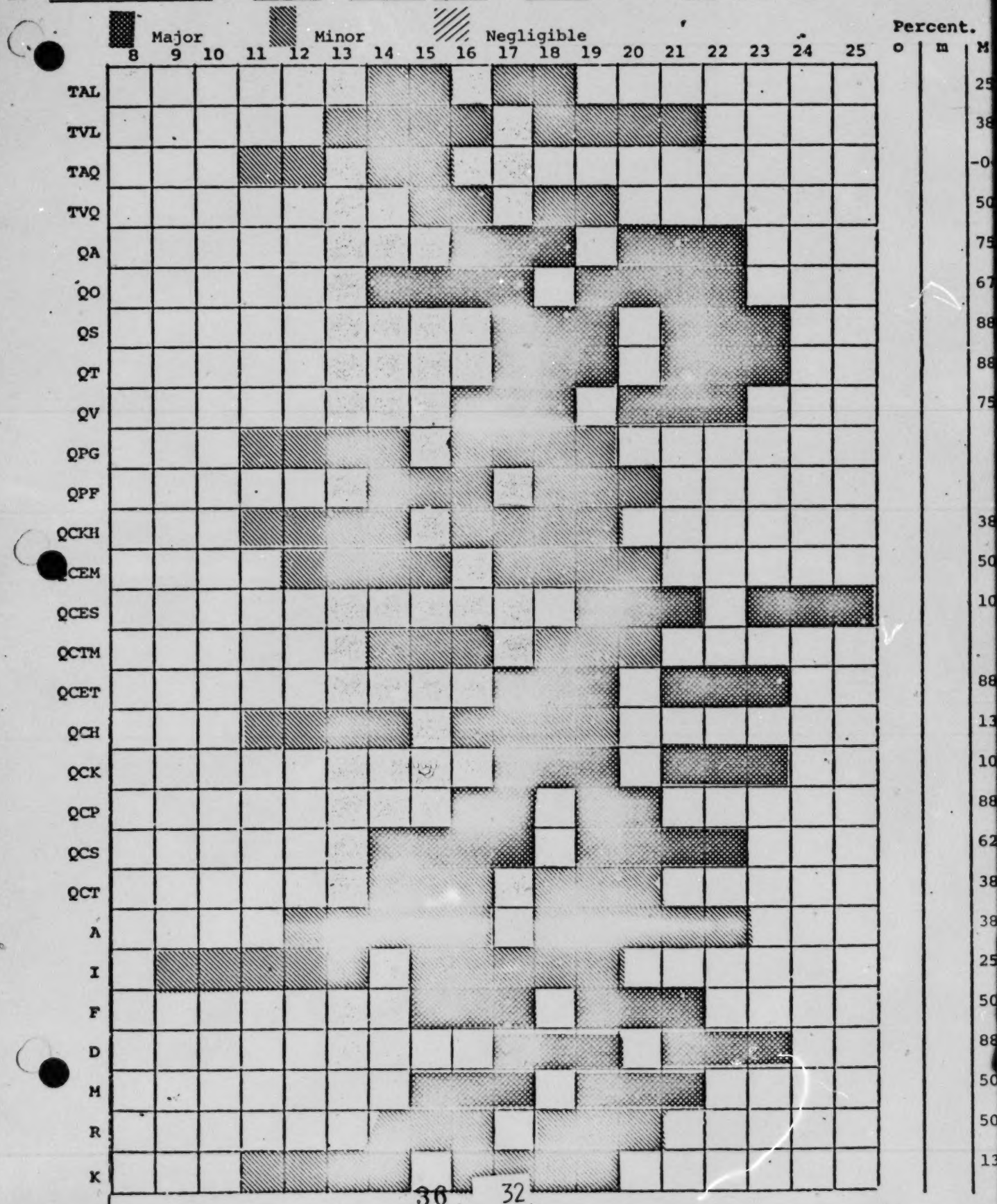
COGNITIVE-OCCUPATIONAL MAP: Statistics Occupation; Clinical Lab Assistant

SUPR.	EMP.	NEGLIGIBLE	MINOR	MAJOR	ST. D.	% MAJORS OCC MAJ	
M	TAL		16.0		2.4	25	
	TVL		17.0		3.5	38	
M	TAQ		13.6		1.9	-0-	
M	TVQ		17.5		2.3	50	
	QA			19.3	2.4	75	X
	QO			18.3	4.0	67	
	QS			20.3	2.7	88	
	QT			20.8	2.9	88	X
M	QV			19.2	3.0	75	X
	QPG		15.5		4.0		
	QPF		17.8		3.3		
	QCKH		15.6		4.0	38	
M	QCEM		16.8		4.0	50	
	QCES			22.5	2.9	100	X
M	QCTM		17.0		2.5		
M	QCET			20.8	3.3	88	X
M	QCH		15.4		3.6	13	
	QCK			20.8	2.3	100	X
	QCP			18.9	1.8	88	X
M	QCS			18.5	3.5	62	
	QCT		17.2		2.8	38	
	A		17.0		5.0	38	
M	I		14.0		4.8	25	
M	P			18.0	2.8	50	X
	D			20.4	3.0	88	X
M	M			18.6	2.5	50	(X)
M	R		17.2		2.6	50	
M	K		15.0		3.9	13	

SBVTE

Date 13-76-C-11 Organization IVTC-07 Occupation Clinical Lab Assistant

S.S._____ QDP_____ QDG_____ P_____ I/C_____ ASSOC. 1.___ 2.___ 3.___



VIII FINDINGS

HEALTH OCCUPATIONS - MEDICAL ASSISTANT

A cursory comparison of the maps for Licensed Practical Nurses and Medical Assistants might produce a conclusion that they are alike. However, upon closer examination it should be concluded that there are apparently small but significant differences in style.

MA's are not the TVL's as LPN's. Only 57 per cent produced a mean of 17.9 (minor). They also produced a relatively low Empathy style (QCEM) with 57 per cent Major and a mean of 18.5.

The Major difference begins to become apparent in their Cultural-Operational Determinant and Inferential Styles. MA's display no preference as to Cultural-Operational Style. LPN's produced a Major "A" "I"; whereas MA's displayed difinite minors in all three elements: "A", "I", and "F":

A - 42 per cent Major, 17.5 mean--minor

I - 42 per cent Major, 17.1 mean--minor

F - 42 per cent Major, 16.8 mean--minor

This apparent display of lack-of-perference might be attributed or coupled to the MA's Supervisory Style which is definitly democratic or participative. On a MacGregor type quiz a score of 29 or less indicates a participative style. MA's produced a mean score of 28.4 the lowest or most participative of all occupations scored. It could be that the MA sees the MA as a side-by-side (chair-side or bed-side) member of the Doctor-Medical Assistant team. Of course this is a conjecture based on a study of the skills and tasks of the Medical Assistant.

Inferentially MA's are "R" - Relational. They did, however, display Majors in the "D" and "M" elements, but they were not as dominant as the "R."

R - 71 per cent Majors, 19.4 mean

D - 57 per cent Majors, 18.4 mean

M - 42 per cent Majors, 18.0 mean

Contrary to the LPN style of M-DR, the MA's style is R-DM.

The following is chart listing the Majors and minors of Primary and Secondary significance, i.e., Primary--Major produced by more than 70 per cent of the selected pupulation; Secondary--Major or significant minor produced by 60 to 69 per cent of the selected population. This Primary-Secondary chart is followed by the results of the Supervisors Empirical Scan of this occupation(MA).

MEDICAL ASSISTANT DELINEATION OF MAJORS AND MINORS: Majors-In Caps
minors-lower case

PRIMARY	SECONDARY
TVQ	tvl
QA, QT, QV	
QPF	
QCES, QCET, QCK, QCK, QCTM	qcem, qcp
R	qch
	D, M

SUPERVISORS EMPIRICAL SCAN

TAL, TVL, TAQ, TVQ

QV

QCKH, QCEM, QCTM, QCET

QCP, QCS, QCT

I, F

DM-R

Investgator's note: Although only seven(7) Medical Assistants were found to participate in the survey, there were seven(7) Indiana Vocational Technical College-Terre Haute students available for survey who had just completed the Medical Assistant program. The results of this successful-student-survey corroborated the findings on the occupational survey. Of performing MA's there was one exception; the student MA's produced a slightly higher (33 compared to 28.4) score on the supervisory-style quiz. Nevertheless, 33 is more participative than authoritarian.

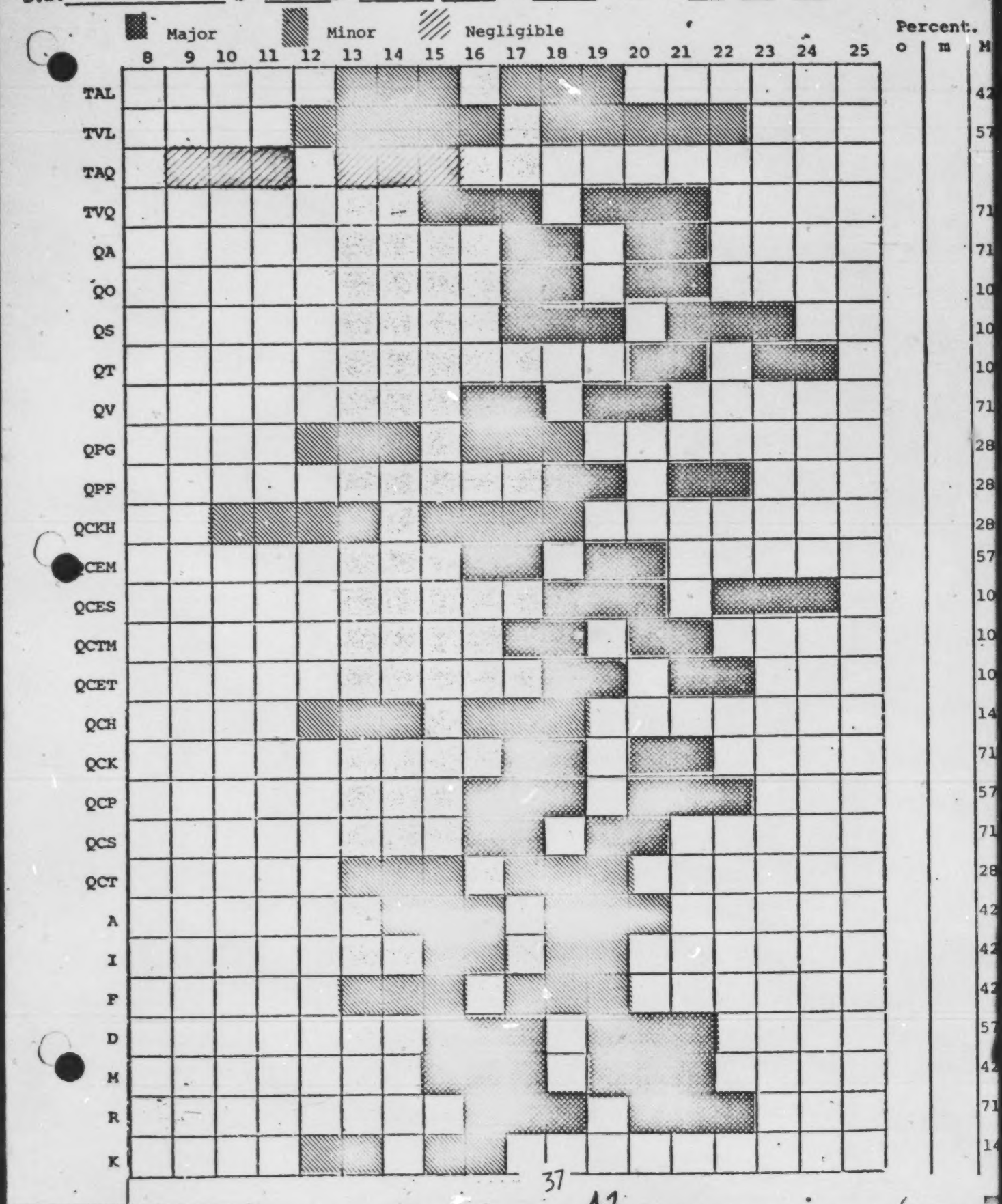
COGNITIVE-OCCUPATIONAL MAP: Statistics Occupation; Medical Assistants

SUPR. EMP.		NEGLIGIBLE	MINOR	MAJOR	ST. D.	% MAJORS	OCC MAJ
	TAL		16.4		2.5	42	
	TVL		17.9		4.5	57	(X)
	TAQ	12.1			2.7		
M	TVQ			18.6	2.5	71	X
M	QA			19.0	1.8	71	X
M	QO			19.1	1.9	100	
M	QS			20.7	2.5	100	
M	QT			22.7	2.4	100	X
M	QV			18.9	1.9	71	X
	QPG		15.7		2.9	28	
	QPF			20.2		28	
	QCKH		14.6		3.9	28	
M	QCEM			18.5	2.2	57	
M	QCES			21.4	2.7	100	X
	QCTM			19.0	1.8	100	X
M	QCET			20.7	1.4	100	X
	QCH		15.1		3.0	14	
M	QCK			19.6	2.4	71	X
M	QCP			19.3	2.5	57	
M	QCS			18.0	1.6	71	X
	QCT		16.3		3.0	28	
	A		17.5		2.5	42	
	I		17.1		2.2	42	
	F		16.8		2.9	42	
M	D			18.4	3.2	57	(X)
M	M			18.0	2.6	42	
M	R			19.4	3.2	71	X
	K		14.3		2.4	14	

SBVTE

Date 13-76-C-11 Organization IVTC-07 Occupation Medical Assistant

S.S. _____ QDP _____ QDG _____ P _____ I/C _____ ASSOC. 1. ___ 2. ___ 3. ___



VIII FINDINGS

HEALTH OCCUPATIONS - LICENSED PRACTICAL NURSE

Supervisors see LPN's as perfect student types, Majors in all Theroretical elements: however, the Cognitive Map of the LPN's revealed them as Major TVL and TVQ only.

TVL - 70 per cent Major, 18.9 mean

TVQ - 74 per cent Major, 18.7 mean

This investigator here empiricizes that, quite possibly, supervisors of LPN's, who for the most part are Registered Nurses with two or four-year degrees, see LPN's as they see themselves. They remember too well their baccalaureate days, and assume that LPN's learn, and function just as RN's--which may or may not be the case as revealed by the differences between the Occupational Map and the Supervisors Emperical Scan.

Tactile and Visual, in that order, are the Sensory strengths of LPN's.

QT - 92 per cent Majors, 22.0 mean

QV - 70 per cent Majors, 19.0 mean

The curious thing about the LPN's Empathy Style (QCEM) is that, although 78 per cent scored a mean of 19.2 (which, relatively speaking, is not exceptionally high) 19 per cent show a minor and 4 per cent show a negligible. Maybe the old saw, "The doctor should not become too involved with the patient," holds in this case. Their Histrionics or role-playing style shows a healthy or relatively strong mean score of 15.3 with 25 per cent Majors and 67 per cent minors. (Do LPN's have to act parts in many scenarios of hospital life?)

Physical activity and total-body control is not the style of the LPN. Only 14 per cent showed a Major QCKH and 3 per cent showed a Major QPG. But, reading the unspoken language of expressions and gesture is definitly a style quality. 81 per cent produced a Major mean of 19.9 in QCK-Kinesics.

Considering the Cultural or Operational determinants Associative, Individual, and Familial, LPN's are:

A - 74 per cent Majors, 19.2 mean

I - 56 per cent Majors, 18.0 mean

They prefer to operate in small (two to three) peer groups or, secondarily, Individually.

Their Modalities of Inference or Reasoning style is M-DR.

M - 85 per cent Majors, 19.6 mean

D - 70 per cent Majors, 19.0 mean

R - 67 per cent Majors, 19.1 mean

Their key is "M".

Below is a chart listing the Majors and minors of Primary and Secondary significance, i.e., Primary--Major produced by more than 70 per cent of the selected population, Secondary--Major or significant minor produced by 60 to 69 per cent of the selected population. This Primary-Secondary Chart is followed by the results of the SES of this occupation.

LICENSED PRACTICAL NURSE DELINEATION OF MAJORS AND MINORS: Majors-In Caps
minors-lower case

PRIMARY	SECONDARY
TVL, TVQ	tvl
QT, QV	qa
QCES, QCET, QCEM, QCT qch, qckh, qct	
QCK	QCP, qs
A	I, f
M, D	R, k, QCTM

SUPERVISORS EMPIRICAL SCAN

PRIMARY	SECONDARY
TAL, TVL, TAQ, TVQ	
QCES, QCET, QCH, QCEM, QCK	
QCKH, QCP, QCS, QCT	
A, F	
D-M-R	

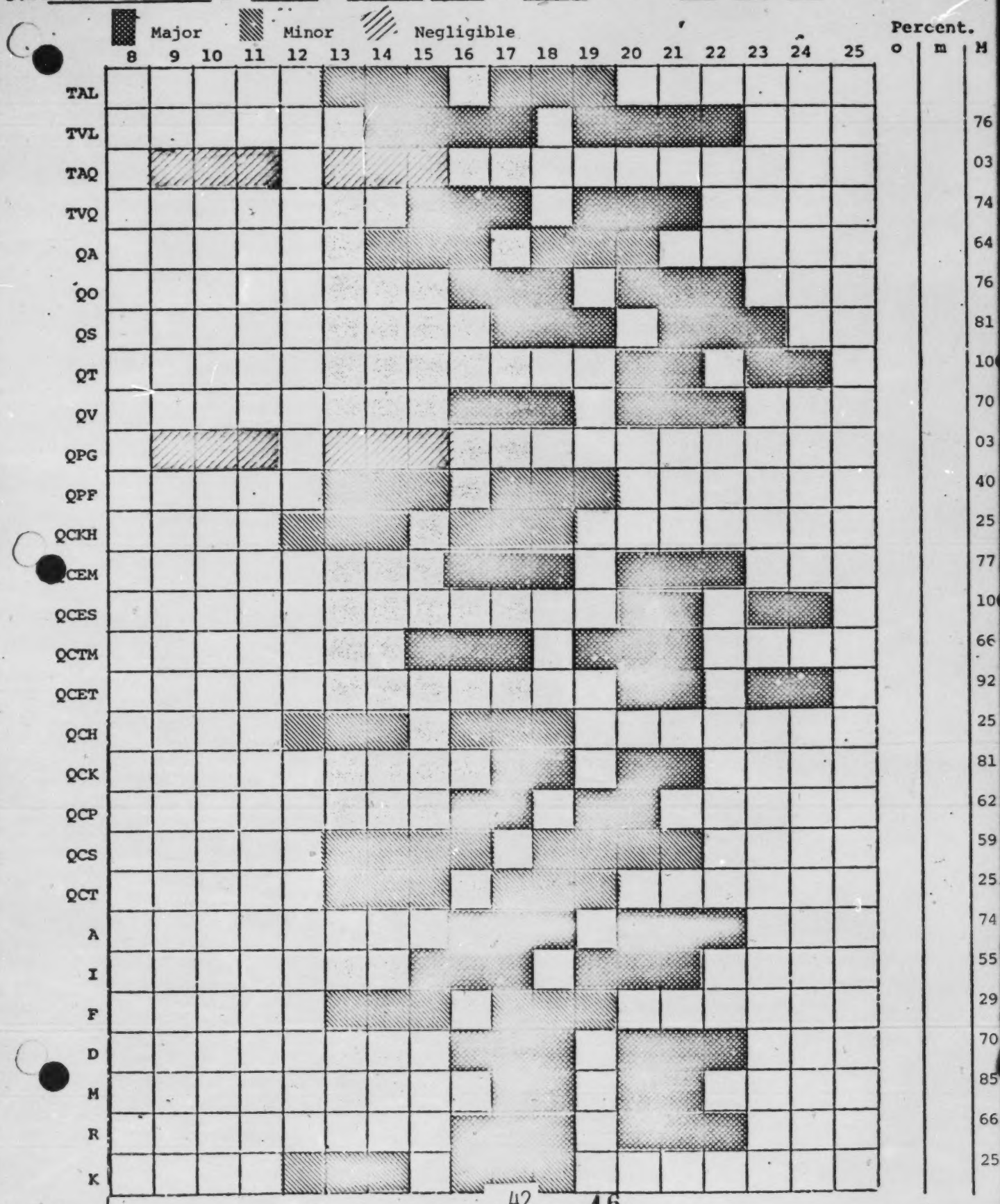
COGNITIVE-OCCUPATIONAL MAP: Statistics Occupation; LPN

SUPR.	EMP.	NEGLIGIBLE	MINOR	MAJOR	ST. D.	% MAJORS
M	TAL		16.3		3.2	
M	TVL			18.9	3.8	76
M	TAQ	12.4			2.7	03
M	TVQ			18.7	2.7	74
	QA		17.7		2.7	64
	QO			19.0	3.3	76
	QS			20.1	2.5	81
	QT			22.0	2.3	100
	QV			19.0	2.5	70
	QPG	12.0			3.0	03
	QPF		16.6		3.0	40
M	QCKH		15.2		2.8	25
M	QCEM			19.2	3.1	77
M	QCES			22.3	2.4	100
M	QCTM			18.2	2.6	66
M	QCET			22.1	2.4	92
M	QCH		15.3		2.8	25
M	QCK			19.9	2.3	81
M	QCP			18.5	2.3	62
M	QCS		17.2		3.8	59
M	QCT		16.2		2.9	25
M	A			19.2	2.8	74
	I			18.0	2.9	55
M	F		16.4		2.9	29
M	D			19.0	2.8	70
M	M			19.6	2.4	85
M	R			19.1	3.2	66
	K		15.6		2.5	25

SBVTE

Date 13-76-C-11 Organization IVTC-07 Occupation LPN

S.S._____ QDP____ QDG____ P____ I/C____ ASSOC. 1.___ 2.___ 3.___



Percent. o	m	M
TAL		
TVL		76
TAQ		03
TVQ		74
QA		64
QO		76
QS		81
QT		10
QV		70
QPG		03
QPF		40
QCKH		25
QCEM		77
QCES		10
QCTM		66
QCET		92
QCH		25
QCK		81
QCP		62
QCS		59
QCT		25
A		74
I		55
F		29
D		70
M		85
R		66
K		25

VIII FINDINGS

DRAFTING

In establishing a Cognitive-Occupational Map a clearer picute can be obtained with the larger number of participants. The ideal number is twenty (20) with a minimum of ten (10). In the case of producing the drafting map, only six "draftsmen" could be found within the participating companies or businesses of the project. The map produced from this small number was not clear and could not be deemed conclusive. However, the investigator had in his files the maps produced in 1974 by entering students in the Associate Degree Drafting Program at Indiana Vocational Technical College, Region 07, Terre Haute, Indiana. These maps were derived from earlier pilot mapping projects conducted by the investigator. The producers of the maps had since been graduated, and several of the students were working successfully in their trained profession. Their instructor, head of the program, was asked to select, what he considered, the top five from the group of maps.

One of the top five was selected with reservations. In the words of the instructor, "He is an excellent Technician, he is somewhat lacking in creativity and math ability, but he can do an excellent job at copying or reproducing." The Major difference between this student's map and the definitive map of the occupation was apparent in his lack of the strong "R" necessary for drafting persons, and his Major "M" and "D" which would account for his being a "technician able to copy and reproduce."

> Investigator's note: From empiricism made in my four years experience in Cognitive Mapping, "M's" appear to prefer a rather static environment. They dislike "systems-disruptive" instances. They shun boat rocking. "D's" are good duplicators, comparing and contrasting.

With the six(6) performing maps and the five (5) selected-student Maps the Occupational Map produced a clearer and more conclusive picture.

TVL, TVQ is the Theoretical style of the Draftsmen. They produced a middle-minor TAL and an almost negligible TAQ. So, they prefer to read and to deal with written numbers or quantities. They prefer not to deal with spoken numbers.

It is interesting that Supervisors see their style as Major in all theoretical elements: TAL, TVL, TAQ, and TVQ.

Their Sensory style is QV, QV, and QA. However supervisors see them as QV's only.

Supervisors, for some reason, see draftsmen as Majors in both QPG and QPF, but the draftsmen produced minors in both elements. Draftsmen are not physical types. They produced minors in both QPG-Body control in space and QCKH-ability to perform total-body activites.

Their strongest Major was produced in the QCES-appreciation of beauty. They also produced Majors in QCTM-time conscious and QCET-code commitment. They have a good knowledge of themselves revealed by a Major in QCS-self-knowledge.

As for their Cultural-Operational determinant, they produced minors in all three "A", "F", and "I." Their ranked preference is "A", "F", "I." On the other hand, supervisors see them as Majors in all three with the "I" being dominant.

"R", "K", "M" is their Inferential style with a minor "D." As mentioned previously, the student who was analyze as an excellent technician but lacking creativity and math ability, produced a strong "M" "D" style with his lowest scores in "R" amd very low in "K." The low "K" coupled with his low TAQ and TVQ would naturally produce a low Math ability. Incidentally, the student in question also had the lowest score in the element QCES, but his "M" "D" made him a "technician-reproducer."

A word must be said about the supervisory style of draftsmen. The maps from the on-the-job draftsmen came from two separate companies: the office of the City Engineer of Terre Haute, Indiana and the Charles Pfizer Company of Terre Haute, Indiana.

In assessing the supervisory style of anyone or any group, the score produced on a MacGregor-type instrument indicates supervisory preference. A score of 39 or more indicates an Authoritarian style; a score of 29 or less indicates a Participative or Democratic style. The draftsmen from the Terre Haute City Engineering Office produce an average score of 38, very near authoritarian; the draftsment from Pfizer Company produced a score of 30, very near participative.

> Investigator's Note: The investigator has been familiar with the Charles Pfizer Company for several years and in his empirical conclusion has observed this company as a "low-turnover" company. It encourages employee participation in its activities; fringe benefits, stock sharing, etc. This might account for the participative style of this company's draftsmen. In any event, it is a phenomenon that could lead to future investigation possibilities.

COGNITIVE-OCCUPATIONAL MAP: Statistics Occupation; -Drafting

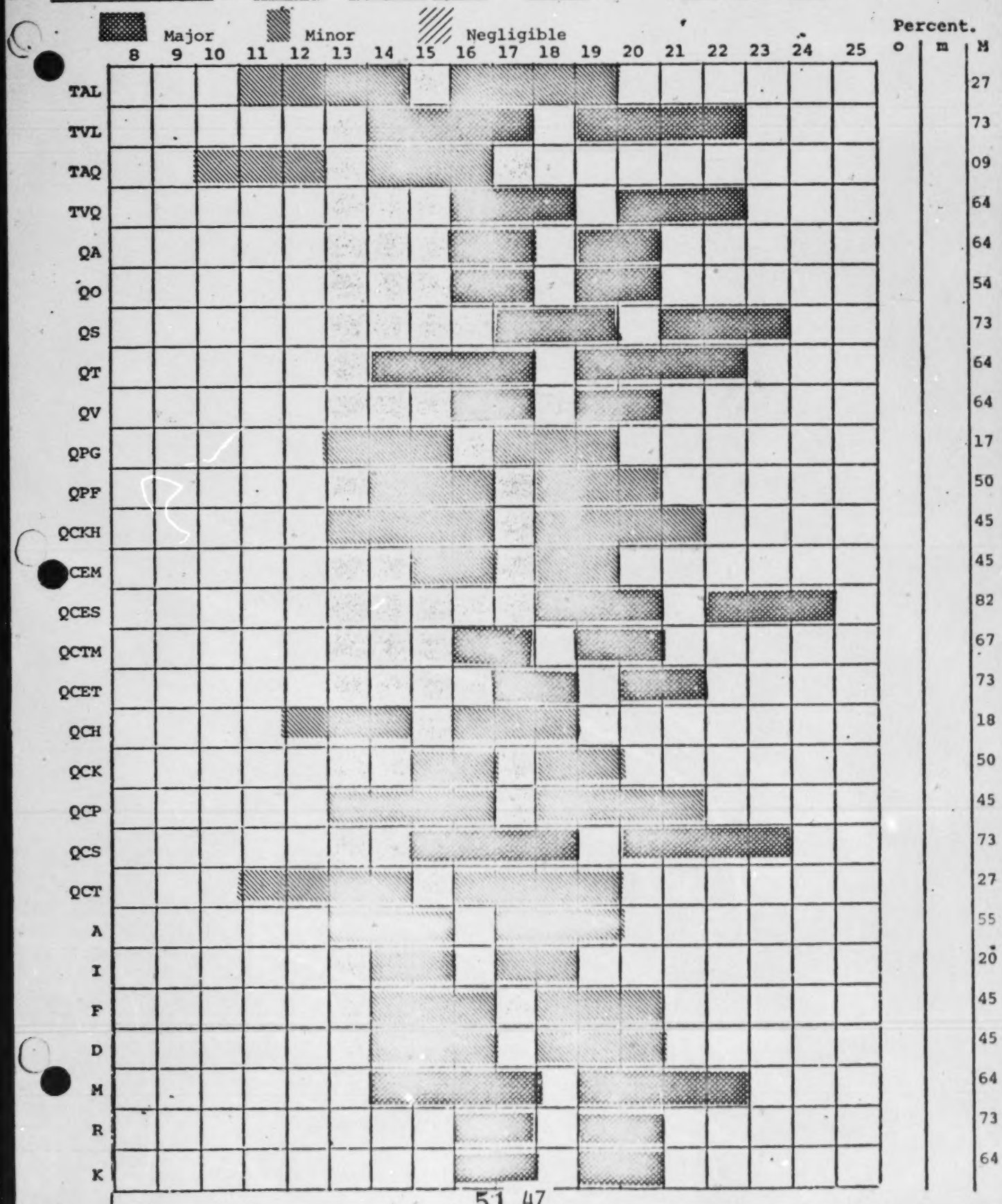
SUPR. EMP.		NEGLIGIBLE	MINOR	MAJOR	ST. D.	% MAJORS	OCC MAJ
M	TAL		15.4		3.8	27	
M	TVL			18.8	3.8	73	X
M	TAQ		13.8		2.7	9	
M	TVQ			19	2.5	64	X
	QA			18.5	1.9	64	X
	QO			18.1	2.4	54	
	QS			20	2.6	73	
	QT			18.8	3.5	64	(X)
M	QV			18.5	1.9	64	(X)
M	QPG		16.5		3.	17	
M	QPF		17.2		2.5	50	
	QCKH		17.8		4.8	45	
	QCEM		17.5		2.3	45	
M	QCES			21	2.8	82	X
M	QCTM			18	2.1	67	X
M	QCET			19.7	2.4	73	X
	QCH		15		3.3	18	
	QCK		17.3		2.2	50	
	QCP		17.4		3.5	45	
M	QCS			19.5	3.5	73	X
M	QCT		15.5		4.4	27	
M	A		16.9		3.4	55	1
M	I		16.		1.6	20	3
M	F		17.		3.2	45	2
M	D		17.6		2.7	45	4
	M			18.	3.8	64	2
M	R			18.4	2.	73	1
M	K			18.7	2.1	64	3

SBVTE

Date 13-76-C-11 Organization IVTC-07 Occupation Drafting

54

S.S. _____ QDP _____ QDG _____ P _____ I/C _____ ASSOC. 1. ___ 2. ___ 3. ___



VIII FINDINGS

ELECTRONICS

The primary purpose of this survey, as in all other occupations surveyed, was to derive the Occupational Map of a job that required the training qualifications of an Indiana Vocational Technical College graduate. In this specfic case, a job title that could be filled by persons with a two-year Associate Degree in Electronics.

Two different geographic locations, the Public Television Broadcast facilities of Indiana University, Bloomington, Indiana and the Electronics Department of the Naval Weapons Support Center, Crane, Indiana, and three different job titles, Broadcast Technician, Electronic Technician, and Electronics Mechanic, were surveyed.

This presented an opportunity to compare the Occupational Map requirements of the overall occupation and the Maps of specific job-titles within that occupation. On page 52 is a statistical comparison which notes: 1. the mean score, 2. the standard deviation, and 3. the percentage of Majors.

As often observed in the technical occupations, there were no "Academic or student types." Only one job-title, Broadcast Technician, produced a Major TVL with a mean score of 18.9, but only 45 per cent were Majors. The major Theoretical Element for Electronics is TVQ which produced a Major from all three job titles, with an aggregate mean of 18.9, and a standard deviation of 2.4, and a Major percentage of 73.3. This Major-revelation coupled with the groups minor scores in TAQ appears to point to a need to de-emphasize the tradifional oral or lecture-instruction in mathematics.

Also, these map revelations coupled with "I" shown by two of the job titles and their Majors, QA, QT, QV, QCET, QCS, would indicate math instruction

through programmatic, visual media-methods would be more in keeping with the style of these job-titles or this general occupation. Another alternative would be Peer Mediated Instruction (PMI) because of their secondary Major "A." (see Investigator's Note on following page)

In the Sensory elements the total Occupational group produced Majors in the significant QA, QT, QV. Although the Electronic Technician did not come through loud and clear in the Element QV: 55 per cent producing a mean of 17.8 could only be considered a strong minor score (a near-Major)

Looking at the minor Theoretical tendancies and the high Sensory (QA, QT, QV) tendancies, we could conclude that we have another "see-do" group which learns by demonstration (audio-visual) performance. In other words, the laboratory session is where they learn. They might see and hear in a classroom, but they learn in the lab.

Their strong "I" and "R" indicates "they would work it out themselves." Their relatively strong Associative style could also indicate they learn from each other.

Their strong QPF (knowing where their hands are and having control over them) plus the Major QT would indicate they are hands-on-types. They are not total-body or physical types as revealed by the minors in QPG and QCKH.

Other style-contrasts can be made by comparing the results on page Briefly the total group produced Majors in the Social-Self Elements in QCES (perception of beauty), QCET (code for goal commitment), and QCS (knowledge of the self.

The total group's Cultural or Operational Determinants run thus: 1. I - Major, 2. A - Major, 3. F - minor. So, they operate, preferably, alone as Individuals or Associatively in small two or three-man teams, but Familial or group work is a minor style. Educationally this would imply

Individualized instruction or Peer Mediated Instruction, but classroom instruction would appear to be a minor style.

> Investigators Note: At the same time this projec was under investigation, an instructor at Indiana Vocational Technical College, Region 07, Terre Haute, was conducting research to determine the effectiveness of small-group (socio-gramic) instruction and study for electronic students studying for FCC examinations. The conclusions of his project were:
>
> ....the results indicated that there is a significant difference .....suggesting there was addition FCC related electronic knowledge learned by the students in the study group and that the study group procedure provided a higher learning rate for the student than class study procedure. The student personal group growth and group participation observations indicated that the study groups offered an effective and worthwhile learning tool for the study of FCC related electronics.(6)

"R" is the overall key to the group's Modality of Inference. The Broadcast Technicians produced an (R-M), the Electronics Technicians produced an (R-K),and the Electronics Mechanics produced an (RDMK) which is indicative of the "L" style of appraisal or troubleshooting types.

GENERAL STATEMENTS OF OBSERVATION:

The Broadcast Technician works in an environment controlled by clocks, calendars, scripts, special vocabulary, procedures--in other words, those elements requiring categorical operation and decisions (M). Yet, he must view the total product in relation to the demands of each element giving equal or commensurate consideration to each (R).

The Electronic Technician, who is usually an engineering assistant, on the other hand produced a rather interesting map because he showed no strong Theoretical or Operational preference. To the "R" there is no black or white, instead, there is a lot of "grayness." "However," "But," "On the other hand," and "Yet" are his key phrases. Blueprints, schematics, and the design of systems are elements of his realm (R-K)).

The Electronics Mechanic is the "hands-on" appraiser or troubleshooter. Tracking down with test-instruments, comparing and contrasting possibilities, and working from schematics (not designing) is his style (RDMK-L)

COMPARISON OF INNER-OCCUPATIONAL DIFFERENCES AMONG THREE DIFFERENT JOB-TITLES

ELECTRONICS

	BROADCAST TECH	ELECTRONIC TECH	ELECTRONICS MECH	OCCUPATIONAL TOT	(M)
TAL	*14.1/2.1/9	17.2/2.8/41	17.2/2.9/44	16.2/2.6/32	
TVL	18.9/3./45	17.2/2.5/42	16.3/3.1/44	17.5/2.9/45	
TAQ	16.6/2.9/36	15.6/1.8/16	13.5/2.5/11	15.2/2.4/23	
TVQ	19/3.7/64(M)	17.8/2.2/67(M)	20/1.5/89(M)	19.2/2.5/74	M
QA	19.8/2.8/82(M)	18.4/2./58	18.8/1.6/78(M)	19/2.1/74	M
QO	19/3.4/64(M)	18.5/2.8/75(M)	18.4/2.8/67(M)	18.6/3./71	M
QS	19.4/3.5/64(M)	18.3/3.9/58	19.7/4.2/48	19.1/3.9/68	M
QT	19.8/3./73(M)	20.5/2.5/82(M)	21.4/1.8/100(M)	20.6/2.4/84	M
QV	19.9/2.7/73(M)	17.8/3./55(M)	20.1/.8/89(M)	19.3/2.2/71	M
QPG	15.3/3.7/36	15/3.5/18	18/3.6/63(M)	16.1/3.6/35	
QPF	19.2/2.4/73(M)	17.8/2.9/55	19.4/2.7/63(M)	18.8/2.7/45	
QCKH	15.3/3.4/18	15.9/2.3/42	18.2/2.9/56	16.5/2.9/39	
QCEM	18.5/3.3/55	16.2/2.1/25	16.2/2.2/33	17/2.5/39	
QCES	21.7/3./91(M)	19./2.1/83(M)	19.1/2.4/67(M)	19.9/2.5/84	M
QCTM	18/2./45	16.9/3.4/42	17.8/2.4/44	17.6/2.6/35	
QCET	21.8/2./100(M)	20/3./75(M)	21.6/1.9/100(M)	21.1/2.3/94	M
QCH	16.5/3.5/36	16/2.6/42	13.6/3.4/22	15.4/3.2/35	
QCK	19/3.3/64(M)	17.5/2.8/50	19.1/3./89(M)	18.5/3./68	
QCP	18.2/2.8/55	18.1/1.5/64(M)	15.3/1.3/11	17.2/1.9/48	
QCS	19.4/2.9/64(M)	18/1.9/55	19.7/1.7/89(M)	19/2.2/68	M
QCT	15.8/3.3/27	15.8/1.8/18	15.7/2.9/44	15.8/3./29	
A	18/2.4/55	17.6/2.2/45	17.6/3.4/33	17.7/2.7/45	
I	19.3/2.4/64(M)	17.2/2./36	18.7/2.6/67(M)	18.4/2.3/58	
F	16.4/1.8/27	16.1/2.4/33	16.2/3.7/33	16.3/2.6/32	
D	17.9/1.7/55	17.8/2.9/50	19.1/2.3/67(M)	18.3/2.3/58	

-Continued on next page-

Comparison (continued)

	BROADCAST TECH	ELECTRONIC TECH	ELECTRONICS MECH	OCCUPATIONAL TOT	(M)
M	18/.8/64(M)	17.7/2.4/50	18.5/1.6/78(M)	18/1.6/68	
R	18.1 1.3/45	18.2/2.5/42(M)	20.5/2.5.89(M)	18.9/2.1/65	M
K	17.8/2.8/45	18.3/2.7/50	18.7/3.1/67(M)	18.3/2.9/55	

*1. Mean/2. St Dev/3. %Majors

M All three display Majors either by mean or % of Majors (64%+).
M Apparently not critical to occupation.
(M) Major for the job-title or near M.

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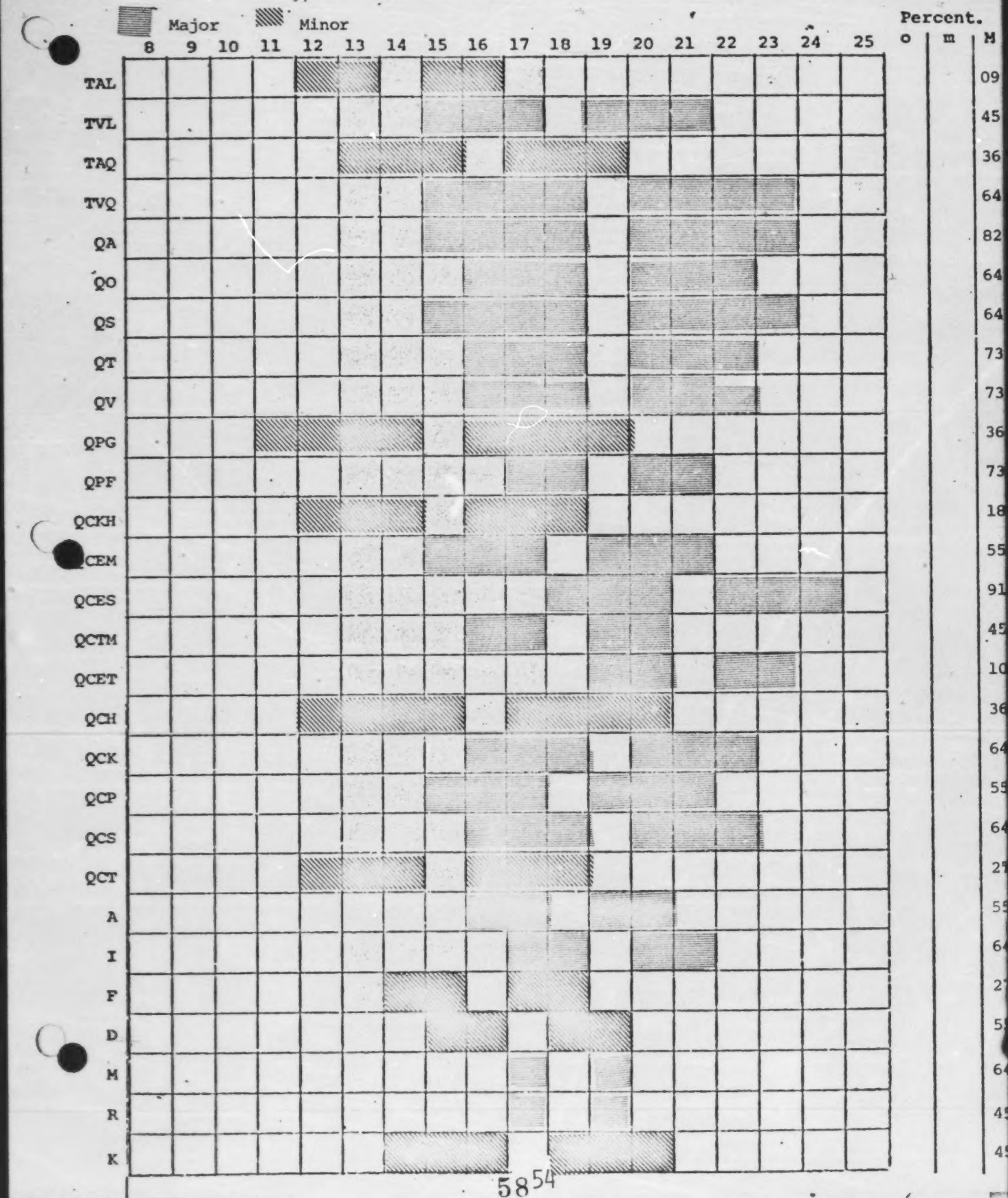
Date 13-76-C-11 Organization IVTC-07 Occupation Broadcast Technology

S.S. _____ QDP _____ QDG _____ P _____ I/C _____ ASSOC. 1. ___ 2. ___ 3. ___



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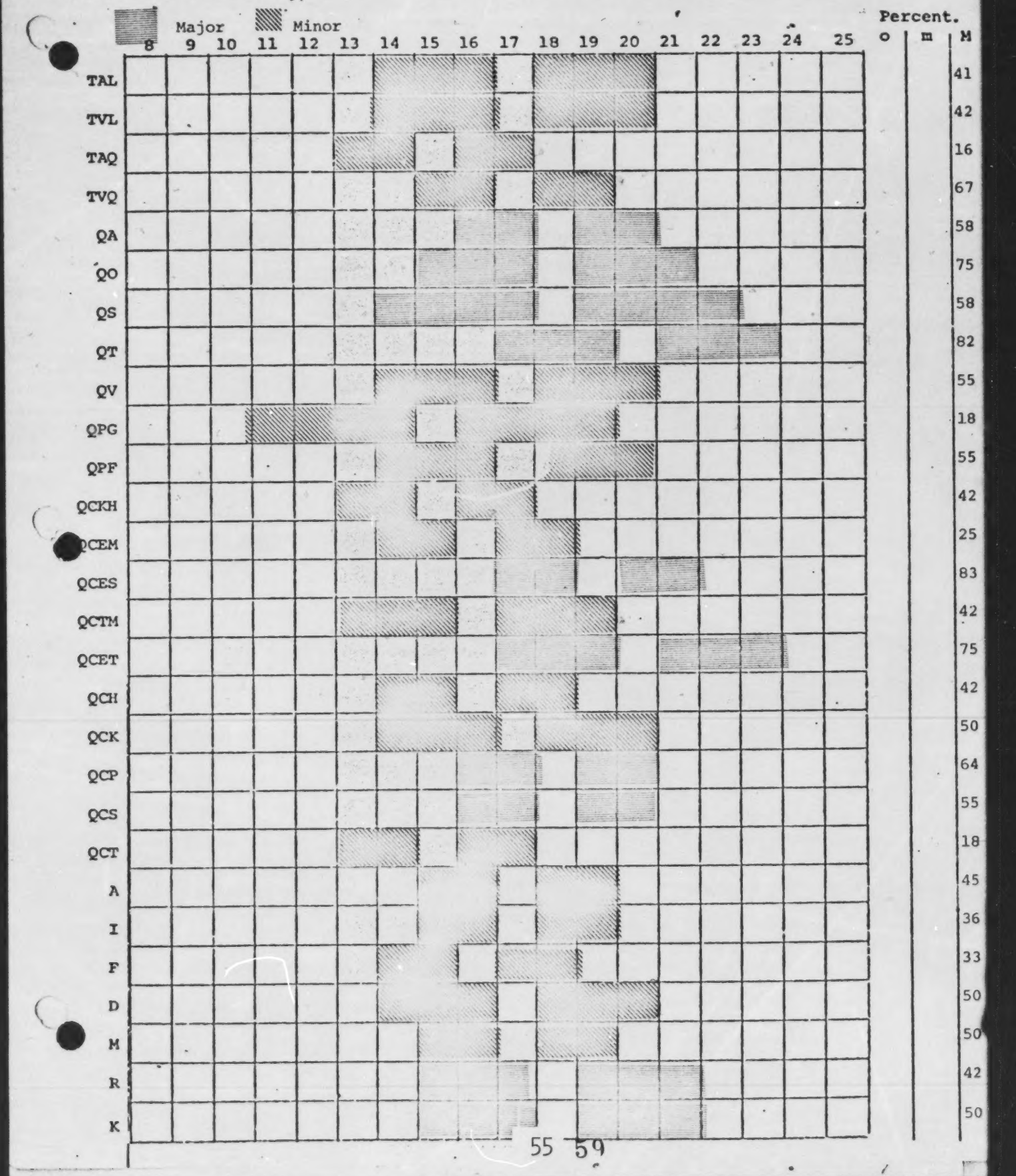
Date 13-76-C-11 Organization IVTC-07 Occupation Electronics Technology

69.

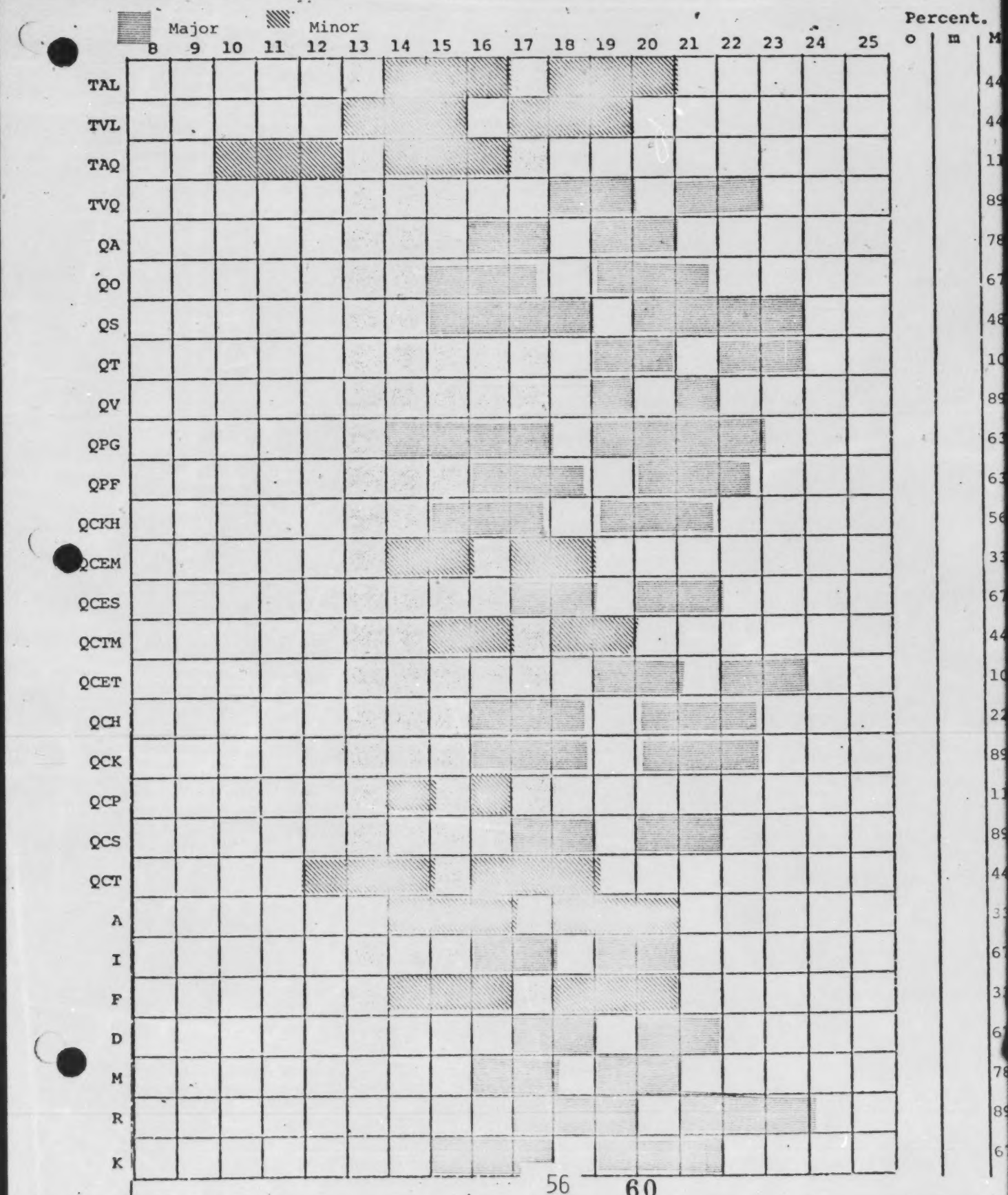
S.S. _____ QDP _____ QDG _____ P _____ I/C _____ ASSOC. 1. ___ 2. ___ 3. ___



SBVTE

Date 13-76-C-11 Organization IVTC-07 Occupation Electronics Mechanics

S.S._____ QDP_____ QDG_____ P_____ I/C_____ ASSOC. 1.___ 2.___ 3.___



VIII FINDINGS

CASE STUDIES

CLINICAL LAB ASSISTANTS:

In an earlier experiment the class of Clinical Lab Assistants (CLA) were surveyed at the request of the instructor in order to produce a Cognitive-Occupational Map and to afford the instructor to better understanding of his students. The instructor and his assistant were also mapped.

The class tended to produce a CLA Map very similar to the Occupational Map shown in this report, pages 31-32: low TAL and TVL, or a non-academic type.

At the counseling conference among the Instructor, his assistant, and the investigator the instructor lightly asked, " Well, what kind of weirdos are we?"

The investigator replied that there were no "weirdos" and that everyone showed strengths in many elements. The investigator recommended, "However," that, because the instructor and his assistant were strong TAL and TVL, they might have a tendancy to deliver academic lectures and assign long reading assignments. This was not recommended by the investigator.

Both the instructor and his assistant were somewhat stunned as they informed the investigator that they had just come from a rather lengthy meeting with the Dean of Region 07 that had been requested by the students. The student's complaints were that the reading assignments were too long and the lectures were too long and difficult to follow.

Since that time, the instructor has left, but the assistant leans heavily toward the "demonstrate-perform" or "see-do" tendancies of the CLA Map. There are still reading assignment and lectures, but they are generally brief "talks" and short reading assignments.

DRAFTING:

In a brief mapping experiment based on empiricisms and Cognitive information from Mapping Colleagues of the investigator, the investigator was able to select the produced maps of the five (5) drafting students which when shown to the instructor received his confirmation that they were his top five students. The investigator also showed the instructor a map of one student with the comment, "I don't know what this person is doing in drafting." The instructor replied, "I don't know either, he is definitely not a 'drafting' type." This student dropped-out, not long after.

ELECTRONICS:

The investigator, through the use of his interview instrments, was able to determine that within the Electronics Department of Region 07, there was one instructor who was a definite "Authoritarian " (X) supervisor and one instructor who was a "Participative or Democratic" (Y) supervisor. The investigator also discovered that there was a (Y) student in the (X) instructor's class and an (X) student in the (Y) instructor's class.

In an interview with the (X) instructor the investigator asked how the instructor got along with a particular student, the (Y) student. The Authoritarian (X) instructor replied that the student in question, the (Y) student, was "smart," "intelligent," "knew his stuff," "made good grades," "BUT." When the investigator asked what the (X) instructor meant by "but". "Well, for example," said the instructor, "If we're in class, and I tell them to go into the lab and wait and don't do anything until I get there, this guy, the (Y) student, will have things set up and already started, and that burns me." (this is a classic case of clash between an Authoritarian supervisor, the instructor, and a participative employee, the student.)

The same procedure was used with the (Y) instructor and the (X) student.

The comments were the same, "smart," "intelligent," etc. However, the complaint was somewhat different. The (X) instructor said that the student (Y) would not "go out on his own. He had to be told everything to do." The only thing that could be done remedially, at that time, was to inform the instructors of the "style-clashes" and why their problems existed.

In the future, this investigator would recommend that (X) students be placed with (X) instructors and (Y) students with (Y) instructors. In the Electronics Department, the investigator also counselled instructors on style-problems with individual students.

WELDERS:

In some pilot work with mapping welders, the investigator learned that within general occupations there can exist Cognitive-Occupational differences among job-titles.

For example, the investigator had in his files the results of some map work on welders in Detroit, Michigan. Assuming that a Welder-Map is a Welder-Map, he tried to impose the Detroit information on the welding students at Indiana Vocational Technical College, Terre Haute, Indiana, who for the most part were trained for construction type welding. The assumption that Detroit Welders are just like Southern Indiana Welders produced considerable trouble and conflict in analyzing the Maps produced by these welding students until a closer analysis of the two job-styles was performed.

The automotive industry,(Detroit), requires a type of welder who is styled for "repetition" or "M"-type performance in the Modalities of Inference. In other words, production work or assembly-line welding.

The Southern Indian welder, (mining and construction) is a "trouble-shooting" type of welder who requires a Major in the three major Modalities

of Inference, (RMD), with a heavy emphasis on the Relational (R), the static and repetitious is just not their style--each job is new and somewhat different.

One major industrial manufacturing company in the Terre Haute area, which, incidentally, did not participate in the program, informed the investigator that one of their major problems was a high attrition rate among their welders. Their welders had to perform the repetitive production work. The investigator suggests that, although the welders who "dropped out" from this company's welding job could weld, the "M"-type job was not compatible to their "R" or troubleshooting style of performance.

Educationally, "M" welders should be counselled into "M" type welding occupations and "R" or troubleshooting welders should be counselled into compatible welding occupations.

SURFACE MINING OPERATING TECHNOLOGY - 76

WELDING TECHNOLOGY - 80

Three mining companies responded to the initial response card: Consolidated, Old Ben, and Peabody. The investigator decided to conduct the survey in the Peabody installations as there were four Peabody mines within 40 miles of Region 07, Terre Haute, Indiana. The investigator received a letter of comfirmation of Peabody's willingness to participate from its office of Manpower Development and also witnessed a memo of participation from the office of the Divisional Superintendent to each of the four mine superintendents authorizing participation and cooperation.

The investigator's plan was to survey first-line supervisors to produce a Cognitive-Occupational Map for the SMOT program. At the same time, the investigator planned to survey Mine Welders, because they were grouped at one particular mine, in order to produce a Mining-Construction Welder Map.

The project ran smoothly: contacts were made at each mine, the survey instruments were distributed, mine superintendents were met and informed. Everything was "A" OK."

When the investigator made a check-back visit five days later, he was told that Peabody did not wish to participate in this type of program.

Therefore, SMOT-76 and WELDING-80 Cognitive-Occupational Maps were not produced.

IX EVALUATION OF PROJECT

The prime objective of the project was to produce Cognitive-Occupational Maps derived from Cognitive Maps of successful or surviving individuals in given occupations.

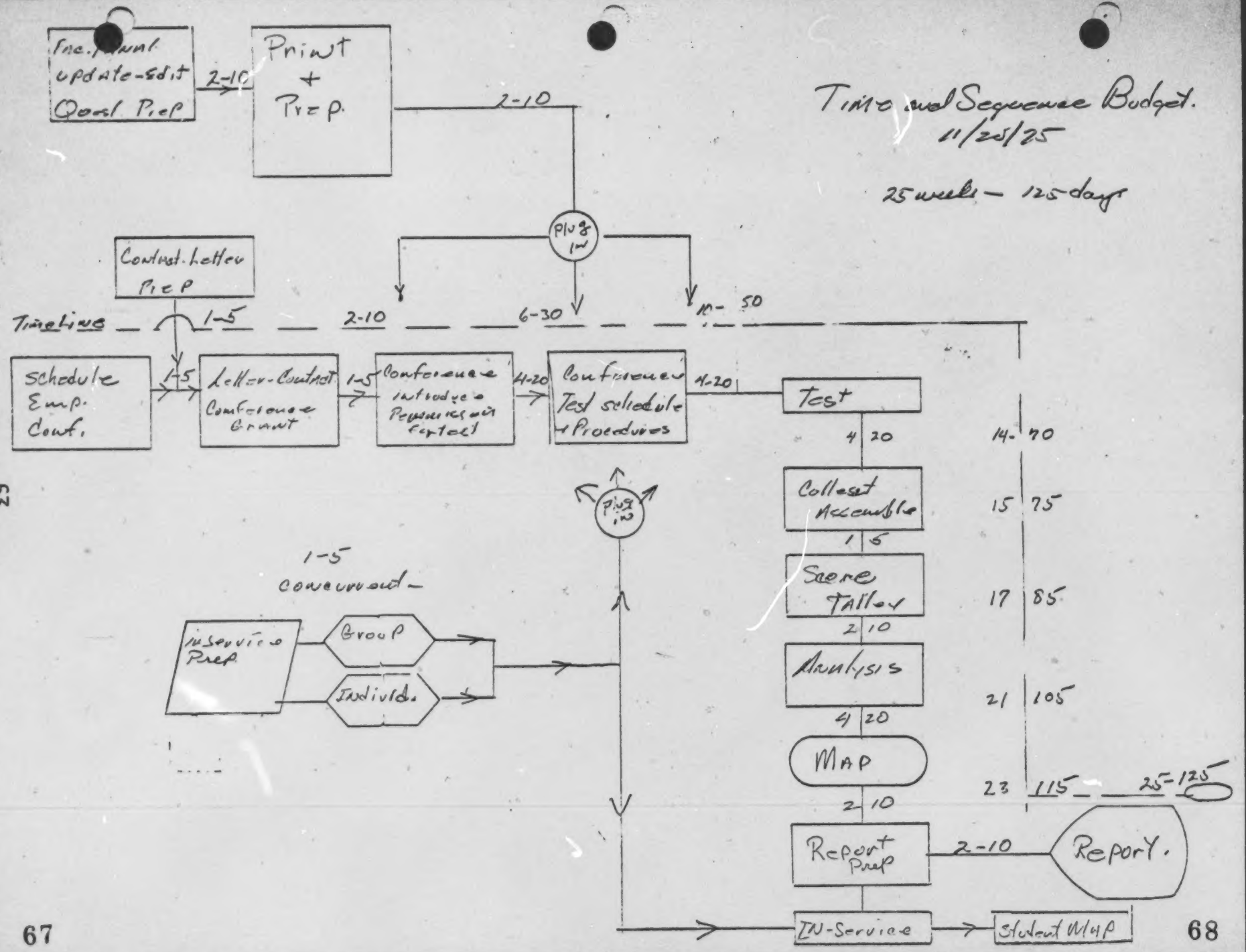
A secondary objective was to prepare in-service training data and materials.

The prime objective can be considered accomplished as this report contains the Maps and analytical data for ten job-titles. The project also revealed that no two maps were the same even among job-titles within a general occupation area.

The prime objective was accomplished according to the "Time and Sequence Budget on page . All deadlines were met, and all task-stations were completed.

The secondary objective, In-service Training, shown on the chart in a "plug-in" configuration, is ready to the extent that an individualized program needs only to be printed and the group training material would need approximately two weeks for the production of materials,

In addition to meeting the above objectives, the project through the cooperation of the computer-instruction program of Mallory Tech, Indianapolis, has produce a complete computer program for scoring and produce future individual and occupational maps.



Time and Sequence Budget.
11/25/25

25 weeks — 125 days

63

67

68

X CONCLUSIONS

Cognitive Mapping is an invaluable tool to assist counselors, instructors, and administrators in this age of Student Centered Education. It is not recommended that it be considered the only method of assessment or evaluation, but it is strongly recommended that it be included in the educator's battery of evaluation instruments or, so to speak, "toolbox."

Cognitive mapping is a valuable tool for assisting in educational management decisions. It does not, however, make decisions, but should be considered only as a data-scource in the educational manager's decision making process.

Quite un-like the myriad of tests for aptitudes, intelligence, etc. which give rather narrow assessments, Cognitive Mapping presents a rather broad view of an individual's style in relation to education or occupation, and should be used as an indication for the use of other evaluations.

Cognitive Mapping should not eliminate the use of these other instruments, but it may be used to diminish the number of persons to be tested by these instruments; thereby, producing a more economical and efficient system.

Cognitive Mapping was originated to provide the ability to assess an individual's style but, as shown by this report, it also is an excellent descriptive instrument which may be used to reveal the Cognitive Style necessary for success in any given occupation. Therein lies its value as a counseling tool.

Its value is enhanced when the ease of administration is considered. This project revealed that the Survey can be administered Individually without supervision, and data-feedback indicates that the time for completing the survey ranged from 20 to 50 minutes.

The investigator noticed a universally high degree of interest from industrial and business administrators who participated in the project. They all asked for copies of the results of the findings. One personnel director made this observation of Cognitive-Occupational Mapping: "I can see where this kind of approach would have helped to eliminate the mistakes we made ten years ago that we are living with today."

SUPERVISORS EMPIRICAL SCAN:

The Scan was designed to be completed by supervisors of occupations or job-titles under survey. The questions asked the supervisors were directly related to Cognitive Elements.

However, the investigator feels that this instrument needs editing and revision because of the many inconsistancies between the SES and the produced Cognitive-Occupational Map. The investigator also feels that there is the possiblility of Style-Transfer: That is to say that, a supervisor assessing another job-title might have a tendancy to read his own style or preference into a description.

Nevertheless, the SES is a valuable and necessary input, but needs re-work.

NORM-BASING:

As previously stated, Cognitive Mapping is a description of an individual's style-pattern of the arrangement of the Majors and minors produced in the twenty-eight (28) Elements of Cognitive-Style Mapping.

This investigator is aware of attempts to produce norms and even an attempt to produce an algorithmic solution to Cognitive Style variations. These attempts at standardization could possibly be viable if the individual

were to remain static. But Maps do change and can be altered by changes in the environment.----either by training or the gestalten.

The attempt to produce norms in New York State were inconclusive although this investigator referred to the work several times in this report. The references were made merely to say, i.e., if an individual scores a 16, 64 per cent, in the Element Qualitative Code Histrionic, he might be more histrionic than some, but it does not appear to be a Major in his style.

The algoritmic approach is an attempt to impose an exact recipe with precisely defined procedure on a problem that changes, vascillates, and varies in degree---the human organism.

X RECOMMENDATIONS

From the previous Conclusions and the results of the Findings, it would appear that Cognitive Mapping should be advanced from a pilot or test structure to operation-status and be utilized in the Indiana Vocational Technical College system. Therefore, the following recommendations are delineated:

1. Initiate a Regional program to orient and educate Regional Administrators, Counselors, and Program Advisory Committees to to the Cognitive-Occupational Mapping concepts and techniques.

2. Administer the Regional program of instructor-orientation by Regional personnel who have become competent in Cognitive Mapping.

3. Initiate a Regional program of student familiarization through orientation classes conducted by Regional personnel competent in Cognitive Mapping.

4. Standardize the Cognitive Mapping program through centralized control of instrument-design, compilation, distribution, and computor assistance.

5. Produce Cognitive-Occupational Maps for all occupations related to Indiana Vocational Technical College curricula.

6. Set up liaison program among Regional-serviced high school vocational-technical programs for Indiana Vocational Technical College to provide Cognitive-Mapping data and consultation service.

7: Select three or four Regions other than Terre Haute who would volunteer to participate in the recommendations aforementioned on an in-service training program basis.

XI FINANCIAL STATEMENT FOR FINAL REPORT ENDING _____
(Date)

Project No. _____

ITEMS	Project Budget FY 19--		Total Expenditures on Project		End of Project Balance	
	Agency	Federal	Agency	State/ Federal	Agency	State/ Federal
A. DIRECT EXPENDITURES						
1. Personnel						
2. Contractual services						
3. Employee benefits						
4. Travel						
5. Supplies and materials						
6. Communications (include phone calls, printing)						
7. Properties (rentals or purchase of equipment)						
8. Facilities						
9. Product production and dissemination						
10. Project Evaluation						
B. INDIRECT EXPENDITURES						
C. TOTAL EXPENDITURES						*

Fiscal Agent/Director: _____

Institution/Agency Name: _____

* Refund this amount to the State Board of Vocational and Technical Education

XII SUPPLEMENTAL AND APPENDIX

COGNITIVE MAPPING TERMS

COGNITIVE MAP: A description of an individual's Cognitive Style showing Majors and minors of twenty-eight (28) Cognitive Elements.

OCCUPATIONAL MAP: A description of a given occupation citing necessary Majors and minors relative to the twenty-eight (28) elements of Cognitive Style.

MAJOR: A score of 70 per cent or more on a parametric scale of extremes (high and low) from the results of a Cognitive Survey for one Element.

MINOR: A score of from 48 to 69 per cent on a parametric scale of extremes from the results of a Cognitive Survey of one Element.

NEGLIGIBLE: Any score of less than 48 per cent on a parametric scale of extremes from the results of a Cognitive Style Survey of one Element.

ELEMENT: One of the twenty-eight (28) measurable codes in Cognitive Mapping.

THEORETICAL:

TAL Theoretical Auditory Lingustic---The style or preference to learning theory or concepts by listening to the spoken word.

TAQ Theoretical Auditory Quantitive---The style or preference of encoding and decoding the spoken number, figure, equation, etc.

TVL Theoretical Visual Linguistic---The style or preference to learning theory or concepts by reading the written word.

TVQ Theoretical Visual Quantitative---The style or preference of encoding and decoding the written number, figure, equation, etc.

SENSORY:

QA Qualitative Auditory---The ability to perceive meaning through the sense of hearing. The tendency or ability to establish an auditory code system of sound discriminations.

QO Qualitative Olfactory---The ability to perceive meaning through the sense of smell. The olfactory coding system of discrimination of odors or smells.

QS Qualitative Savory---The ability to perceive meaning or to make fine discriminations by the sense of taste.

QT Qualitative Tactile---The ability or tendency to perceive meaning through a sense of touch.

QV Qualitative Visual---The ability to perceive meaning through the sense of sight and the tendancy to make fine visual discrimination.

SOCIAL, SELF, PROGRAMMATIC:

QPG Qualitative Proprioceptive Gross---Ability to synthesize, by duplication, total body awareness demanding large or gross musculatory control, coordination and balance to produce a complex, programmatic, systemmatic performance. e.g throwing, climbing, balancing, timing, etc.

QPF Qualitative Proprioceptive Fine---The ability to synthesize, by duplication, a complex programmatic task demanding fine manual or dextral control and coordination. e.g. keyboard operation, handwriting, etc.

QCEM Qualitative Code Empathetic---The tendency to identify with another person's feelings, ideas, wishes, desires, etc. The ability to have a vicarious experience by putting yourself in the other person's place to see things from his point of view.

QCK Qualitative Code Kinesics--- The degree of style of communicating by means of interpreting unspoken expressions of the body or facial gestures.

QCH Qualitative Code Histrionics---The degree of a person's style in which he will stage behavior or deliverately exhibit or contrive emotion or temperament to produce or elict a particular response from others.

QCES Qualitative Code Esthetic--- Tendency to enjoy beauty in objects, ideas, finished products, phraseology, etc, appreciation of the beauty of surroundings are significant to a person displaying a major in this element.

QCET Qualitative Code Ethic---The strength of a person's commitment to a set of values, principles, obligations, duties, etc. This commitment need not necessarily imply morality.

QCKH Qualitative Code Kinesthetic---The tendency to be physical in contrast to academic, manual, digital, etc. i.e. total body action according to form--athletics.

QCP Qualitative Code Proxemics---The tendency of an individual to establish or assume a code of social or physical distance or protocol.

QCS Qualitative Code Synnoetics---The degree of personal knowledge of oneself. i.e. skills, abilities, tendancies, etc.

QCT Qualitative Code Transactional---The ability to maintain a positive communication interaction which significantly influences the goals of other persons involved in that interaction.

QCTM Qualitative Code Temporal---Time consciousness, tendancy to respond or behave according to time constraints or expectations imposed on an activity.

CULTURAL DETERMINANTS: -Operational or functional preferences or tendancies-

A Associative--- Tendency to operate or sometimes depend on the recommendations or in-put from peers or associates

I Individual---The tendency for one to use one's own interpretations as the base for decisions.

F Familial---The tendency to function in a familial decision-making mode. Usually field-dependent relying on the family or the "extended family"

MODALITIES OF INFERENCE: -The tendancy of an individual to favor a particular inferential (thought process) mode for operational functional or decision-making, learning, synthesis, etc.-

M Magnitude---A form of "categorical reasoning" that utilizes the static (norms or categorical classifications--the apriori) as the basis for accepting or rejecting an advanced hypothesis. Persons who need to define or classify things in order to understand them reflect this modality.

D Differential---Similic reasoning--The tendency to reason similically or metaphorically in terms of one-to-one contrasts or comparisons of selected characteristics or measurements. (The creative often possess this modality as a Major--artists, writers, poets, musicians.)

R Relational---The tendency to synthesize a number of dimensions or incidents into a unified meaning, or through the analysis of a situation to discover its component parts. (The ability to see the part in relation to the whole and vice-versa--holistic.)

L Appraisal---(analytical or troubleshooter) Employed by individuals who display Majors in all three Modalities listed above (M, D, and R), with the tendancy to analyze, question and appraise in the process of drawing a probable cause or solution.

K Deductive---The tendency to reason deductively or syllogistically, logical proof. e.g geometry

QDP Qualitative Data Precise---The tendency or habit of the individual to emphasize the minute or detail. Adheres to form and procedures.

QDG Qualitative Data General---The tendency for an individual to de-emphasize details or be reluctant to deal in them. A tendancy to deal in generalities or "somewhere in the ballpark."

P Power---Measured on a scale of on to ten (1-10) the "drive" or dynamic style of the individual

QPS Qualitative Supervision Participative---The tendency to supervise or be supervised democratically or participatively.

QAS Qualitative Authoritarian Supervision---The tendency or preference to supervise or be supervised autocratically or dictatorially.

QSS Qualitative Splitter Supervision---One who is not totally commited to either QPS or QAS. May assume the role of either style.

A. Test Description

Test Name: Cognitive Style Survey
Author: Ray Boyer
Publisher: (Not Published)
Date: 1976
Cost:

Forms of the Test: One form to this date
Grade or Age Level: Junior and Senior High School, College or Adult.
Validity: To check the validity of the Survey profiles or Maps were obtained from samples of individuals who were already deemed successful in given occupations. This provided parameter bases for each of the twenty-eight (28) Cognitive Elements in relation to Element Majors displayed by the occupation. Also, each factor in each Element was designed to range no more than 1.4 from a mean (.60).
Scoring: May be hand-tallyed or computer tallyed.

B. Administering the Survey

Test-Training: No training is necessary. It may be completed by an individual: the Questionnaire, Response Sheet, Tally Sheet, Directions are contained in one booklet.
Time Limits: Research revealed that the survey can be completed in 20 to 50 minutes.
Readability: Reading level is approximately 6th grade (average).
Other Requirements: The surveyed should be informed that a high score is not necessarily a "good" score, neither is a low score a "bad" score. Scores are relative to educational or occupational style-requirements.

C. Interpretation

1. Counselors and interpreters must be trained in the language of Cognitive Mapping and Comparative Assesments of Occupational Descriptions.

2. Cognitive-Occupational Mapping is a non-discriminatory (sex, age race, etc.) technique of describing the Cognitive-Operational Style of an individual or a select group. It does not eliminate personal interview; it enhances it.

SUGGESTIONS FOR TRAINING TO INCREASE ELEMENT STYLES

TAL Apply learning systems in listening, training in listening for main ideas, significant facts, recognizing development. (notetaking and outlining) (check for physical disabilities)

TVL Apply developmental reading improvement systems to increase rate, retention, flexibility and comprehension.

TAQ Apply learning systems which develop skills in handling spoken numbers, figures, etc. -memorization, transcription, etc. Also oral or spoken story problems.

TVQ Apply learning systems that develop skills in handling visual-quantitive: numbers, figures, etc. in written or printed "story situations." (It might be necessary to first develop reading skills - TVL.)

QA Apply learning systems which develop skills in auditory discrimination and differentiation, might be coupled with TAL-TAQ. Example: heart beats, musical tone identification, engine noises, Morse Code, etc.

QO Apply learning system which develops skills in odor identification and differentiation. (Food preparation)

QS Apply learning system which develops skills in taste discrimination. Example: food seasoning - type and degree or extent.

QT Apply learning system which develops skills in touch discrimination Example: thickness, heat-cold, texture, etc. --sculpting, ceramics, etc.

QV Apply learning system which develops skills in visual discrimination. Example: form, placement, precision, etc. (might be coupled with visual QCES.)

QCEM Apply learning system which develops skills in human-empathetic-interplay. Example: group(therapy)development, group discussions, human resource classes or seminars.

QPG Apply learning systems which develop total body control and coordination. Example: modern or classical dance, gymnastics, athletic games, requiring the individual's body control, balance and coordination.

QPF Apply learning systems which develop manual or digital dexterity and coordination. Example: typing or keyboard operation instruction, musical-instrument instruction.

QCTM Apply learning systems which present situations to develop time consciousness, time budgeting, scheduling, performance within time constraints, etc.

QCES Apply learning systems which develop an appreciation of for beauty. Example: appreciation of The Arts, design, decor, etc.

QCET Apply learning systems which develop goal or code commitment. Example: goal or objective writing, goal performance, time budgeting, planning, and management, etc.

QCH Apply learning systems which develop role playing skills. Example: drama or acting classes, role playing sessions in group activity. (QCK)

QCK Apply learning systems which develop skills in interpretation of body movement, action or posture. Example: role playing classes, group sessions, mime, modern dance, etc. (QCH)

QCKH Applications similar to QPG with more emphasis on rules, procedures, constraints, etc., for example, physical games.

QCP Apply learning systems to develop skills in etiquette, protocal, etc. Possibly group sessions. Training would depend on degree or direction of proxemies—postive or negative.

QCS Initiate counseling sessions based on Cognitive Mapping to instill self-knowledge. Apply human resourse development seminars or classes.

QCT Apply learning systems to develop skills in oral communications. Example: speech, dramatics, debate, group session, etc.

A Design study and work tracks to develop associative or cooperative operational tendancies. Example: lab sessions, Peer Mediated Instruction, small peer group seminars.

I Design study and work tracks to develop individual operational tendancies (see QCS)

F Traditional educational systems of delivery form a tendancy to develop the familial or group operational tendancy. However, further strengthening may come from tracks requiring a cooperative team-effort.

D Apply a learning system based on comparison and contrasts. Example: designing, arts, photography, etc.

M Apply a learning system based on categorical reasoning. Example: science, math, vocabulary - also, apply training in traditional test-taking skills (multiple choice, true-false.)

R Apply a learning system requiring decisions based on relationships and foresight. Example: psychology, socialogy, blueprint reading, spatial reasoning, or games such as chess.

K Apply learning systems requiring decisions based on logic or syllogistic reasoning. Example: math, syllogistic reasoning, classic philosopy.

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NECESSARY SOUND DISCRIMINATIONS

FOR AUTOMOTIVE MECHANICS

Utilization of the Q(A) Qualitative Auditory of the sensory stimuli to diagnose engine problems

ENGINE NOISES

A. EXCESSIVE CONNECTING ROD BEARING CLEARANCE produces a metallic knock which is loudest when the engine is "floating" or in transition between pulling and no load conditions at about 40 MPH. The defective rod bearings are found by open-circuiting the individual spark plug wires, one at a time, until the knock subdues. Those open-circuited cylinders that quiet the knocking indicate that their connecting-rod bearings are excessively worn.

B. LOOSE PISTON PINS produces a sharn double knock which is usually heard with the engine idling. The noise will increase in intensity when the spark plug for that cylinder is open circuited. The noise will become louder if the basic ignition timing is advanced and will become quieter if the ignition timing is retarded.

C. A PISTON SLAP due to excessive cylinder to piston skirt clearance produces a double, hollow and muffled sound which is loudest when the engine is cold, and the vehicle is accelerated from low speeds. On some engines the noise will be present between 25 and 50 MPH under constant speed conditions. The noise for a particular cylinder should become quieter when its spark plug is open-circuited.
NOTE: See "D" below.

D. PISTON RING NOISE due to excessive piston ring grove to piston ring clearance produces a rattle or double click similar to a defective valve lifter or excessive valve lash. The noise is loudest during acceleration. The noise for a particular cylinder should become quieter when its spark plug is open-circuited. To momentarily eliminate piston slap and excessive piston pin clearance noises, put 1-2 oz. of SAE 50 oil into each cylinder through the spark plug hole, crank the engine for about 5 seconds, install the spark plugs and note if the noise is reduced or eliminated.

E. A STICKING VALVE produces a muffled explosion or popping heard at the carburetor air horn or exhaust pipe outlet. A stethoscope will pick up the noise, which will be loudest at the base of the valve spring of the sticking valve. The noise also will be loudest at the individual intake (sticking intake valve) port or exhaust (sticking exhaust valve) port of the cylinder head. A sticking valve will cause an engine miss that will often occur after the vehicle has been driven at highway speeds and then allowed to idle.

F. A STICKING HYDRAULIC VALVE LIFTER OR EXCESSIVE VALVE TRAIN LASH AT ONE VALVE produces a clicking noise that is 1/2 engine RPM and may occur intermittently in the case of the hydraulic lifter. The source of the noise can be found by checking the valve cash with feeler stock. The noise will be loudest when a stethoscope probe is placed on the rocker arm stud. The noise will decrease in intensity when the rocker arm is side loaded with a hammer handle.

G. A WORN TIMING GEAR produces a knock that is not reduced by shorting out individual spark plugs or changing engine speed or loading. A stethoscope will usually indicate the noise to be loudest at the timing drive cover or water pump housing (or engines not using a separate timing drive cover).

H. EXCESSIVE MAIN BEARING CLEARANCE produces a bumping noise that is heavier and duller than a connecting rod bearing knock. The noise is loudest when the engine is quickly accelerated from low speeds but may occur under other acceleration or constant speed conditions. Also, it may be pronounced when the engine is first started. The noise may be localized by open-circuiting the spark plugs in pairs, one on each bank, starting at the back of the engine and working forward. The noise should be reduced in intensity.

I. EXCESSIVE CRANKSHAFT END-PLAY produces a sharp rap that occurs at idling and disappears when the clutch of a manual transmission is disengaged. Using a stethoscope the noise should be loudest at the cylinder block or crankcase where the main bearing having the crankshaft thrust faces is located.

J. A LOOSE FLYWHEEL produces a dull and heavy noise similar to a loose main bearing. However, the noise should not change when individual spark plugs are open-circuited. By increasing the idle speed to 750 RPM and turning the ignition switch off and back on before the engine stops, the noise should be heard as the engine re-starts.

K. LOOSE OR WORN ENGINE MOUNTINGS produce a knock or thud during full power acceleration or rapid throttle closing. This may be an occasional noise that may increase or decrease drive line vibration. A visual inspection may indicate the rubber mounting has dried out, separated, or come loose from the attaching brackets.